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## NATIONAL PLANNING COMMITTEE SERIES

The National Planning Committee Series will consist of Reports of the various Sub-Committees, each of which deals with the several aspects of the national life. Each Sub-Committee consists of recognised Experts in the subject; and every Report prepared by them considers all the bearings, implications, and consequences of the subject. Together the Series will make a comprehensive outline of an all-embracing National Plan, which, if and when implemented, would revolutionise the conditions of life in this country. Though most of the Reports were prepared in 1939-40, each is prefaced by an Introduction showing the place of the subject in the entire Scheme of National Planning, and ended by a Summary of Developments which brings the matter fairly up to date.







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**NATIONAL PLANNING, ITS PRINCIPLES &  
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NATIONAL PLANNING COMMITTEE SERIES

(Report of the Sub-Committee)

CROPS—PLANNING AND  
PRODUCTION

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Sir T VIJAYARAGHAVACHARYA

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Dr. BHOLANATH SINGH

*Edited by*

K. T. SHAH

*Honorary General Secretary*

NATIONAL PLANNING COMMITTEE

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To  
All Those  
**MEMBERS OF THE NATIONAL PLANNING COMMITTEE**  
and of  
Its Various Sub-Committees  
**A TRIBUTE OF APPRECIATION**

प्रारब्धमुत्तमजना न परित्यजन्ति

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## PREFACE

The National Planning Committee, appointed in 1938, began its work early in 1939. After defining the nature of a National Plan, and determining the nature and scope of the work entrusted to them, the Committee issued an elaborate and comprehensive Questionnaire which was subsequently supplemented by specific details. Twenty-nine Sub-Committees, formed into eight groups, were set up with special terms of reference to deal with all parts and aspects of the national life and work in accordance with a predetermined Plan.

After some unavoidable delay in getting replies to the Questionnaire, the Sub-Committees began their work, and submitted Reports,—some of them Final, some Interim,—which were considered at the Plenary Sessions of the Parent Committee in 1940. Towards the end of that year the Chairman, Pandit Jawaharlal Nehru, was arrested and sentenced to a long term of imprisonment, during which the work of the Committee had necessarily to be suspended.

On his release a year later, hope revived for an intensive resumption of the Committee's work. But the outbreak of war with Japan, the threat to India's own safety, and the hectic march of political events, rendered it impossible to devote any attention to such work at that time. It, therefore, inevitably went into cold storage once again; and remained for the duration of the war.

When at last the War seemed nearing its end, Pandit Jawaharlal Nehru with other leaders was released. The moment seemed again opportune to resume the work of

the Planning Committee. Meetings of that Body were held in September and November 1945, when certain more urgent questions, already included in the programme of the National Planning Committee, were given a special precedence. A Priority Committee was appointed to report upon them. Changes and developments occurring during the War had also to be taken into account; and another Committee was appointed to review the general instructions, given six years earlier to the Sub-Committees. Revised instructions were issued to them following the Report of this Sub-Committee; and the Chairmen and Secretaries of the several Sub-Committees were once again requested to revise and bring up to date such of the Reports as had already been submitted—either as final or interim—while those that had not submitted any reports at all were asked to do so at an early date.

As a result, many of the Sub-Committees which had not reported, or had made only an Interim Report, put in their Reports, or finalised them. The Parent Committee has had no chance to review them, and pass resolutions on the same. But the documents are, by themselves, of sufficient value, prepared as they are by experts in each case, to be included in this Series.

The following Table shows the condition of the Sub-Committees' work, and the stage to which the Planning Committee had reached in connection with them.

Serial No.	Name of the Sub-Committee.	Final Report		Interim Report		No Reports
		N.P.C. Resolutions	Not con- sidered by N.P.C.	N. P. C. Resolution	Not con- sidered by the N.P.C.	
<b>Group I</b>	<b>Agriculture &amp; other Sources of Primary Production</b>	Handbook Pp.		Handbook Pp.		
1.	Rural Marketing and Finance	97-99				
2.	River Training and Irrigation	83-85				
3.	" " Part I	113-115				
4.	" " Part II	115-119				
5.	Soil Conservation and Afforestation					
6.	Land Policy and Agriculture					
7.	Animal Husbandry and Dairying	87-89			do.	do
8.	Crop Planning and Production					
	Horticulture	102-103				
<b>Group II</b>	<b>Fisheries</b>		do.			
1.	Industries or Secondary Sources of Production					
2.	Rural and Cottage Industries					
3.	Power and Fuel		do.			
4.	Chemicals					
5.	Mining and Metallurgy					
6.	Engineering Industries	75-77		77-79		do.
7.	Manufacturing Industries			130-133		
<b>Group III</b>	<b>Industries connected with Scientific Instruments</b>		do.			
1.	Human Factor					
2.	Labour	89-92				
<b>Group IV</b>	<b>Population</b>	85-87				
1.	Exchange and Finance					
2.	Trade					
3.	Public Finance					
4.	Currency and Banking					
<b>Group V</b>	<b>Insurance</b>					
1.	Public Utilities					
2.	Transport					
3.	Communications	126-129				
<b>Group VI</b>	<b>Social Services—Health and Housing</b>					
1.	National Housing	99-100				
2.	National Health					
<b>Group VII</b>	<b>Education</b>					
1.	General Education					
2.	Technical Education					
<b>Group VIII</b>	<b>Woman's Role in Planned Economy</b>	154-160			do.	

To sum up, fourteen Sub-Committees had made final reports, of which ten have been considered, and Resolutions taken upon them, by the National Planning Committee. Twelve more have presented Interim Reports, of which nine have been considered by the Planning Committee, with Resolutions thereon, while three Sub-Committees have not yet presented any report on the reference made to them.

The idea that all this material, gathered together with the help of some of the best brains in India in the several departments of our national life, should be printed and published was before the Committee from the start. But the interruption caused by the war prevented its realisation. It was once again mooted in 1941; but the moment was not deemed ripe then for such action, partly because the leading spirits in almost every one of the Sub-Committees were unable to devote time and labour to bring their Reports up-to-date; and partly also because war-time restrictions or shortages had made scarcer than ever before the statistics and other facts, which particular sub-committees would need, to bring their work up-to-date. The war-time needs of Government had attracted several of them to work on Government Bodies, Panels, or Committees. For all these reasons it was deemed undesirable that material of this character—valuable as it must be—should be put out in an incomplete, inchoate, obsolete form, which may reflect unfavourably upon Indian capacity for such tasks.

The last four years of the War were thus a period of suspended animation for the National Planning Committee. Even after the end of the war, it has not been feasible, for obvious reasons, for the Planning Committee to resume its work and finalise decisions. Continuous sessions of that body are indispensable for considering and taking decisions on the Sub-Committee reports presented since 1940, and putting all the material into shape, ready for publication, not to mention making its own Report; but the political situation in the country made it impossible. Other conditions, however, are somewhat more favourable than in 1938-39, when the Central Government of the country were all but openly hostile to such attempts. Lest, however, the momentary difficulties make for needless further delay, it was thought advisable by the Chairman and the undersigned that no more time should be lost in putting this material before the Public. Following this advice, it is now proposed to bring out a complete Series of the National Planning Committee's Sub-Committee Reports, which will

serve as appendices to the Parent Committee's own Report. The Plan of the proposed enterprise is briefly summarised below.

Every Sub-Committee's Report, which is in a final form and on which the National Planning Committee has itself taken resolutions, will be edited and published, with an Introduction assigning their due importance to the suggestions and recommendations contained in that particular report, its proper place in the over-all National Plan; and following it up, wherever necessary, by a kind of Epilogue, summarising the developments that have taken place during the seven years, during which the work of the Planning Committee had been in suspension.

Those Reports, again, which, though in a final form, have not yet been considered, and no resolutions taken thereon, by the Planning Committee, will also be included in the Series in the form in which they were submitted, with such Introduction and Epilogue to each as may be deemed appropriate. And the same treatment will be applied to Reports which are 'Ad Interim', whether or not the Parent Committee has expressed any opinion on the same. They will be finalised, wherever possible, in the office, with such aid as the Chairman or Secretary of the Sub-Committee may be good enough to render. Sub-Committees finally, which have not submitted any Report at all,—they are very few,—will also find their work similarly dealt with. The essence, in fine, of the scheme is that no avoidable delay will now be suffered to keep the National Planning Committee's work from the public.

Both the Introduction and the Epilogue will be supplied by the undersigned, who would naturally be grateful for such help as he may receive from the personnel of each Sub-Committee concerned. The purpose of these additions is, as already stated, to assign its true place to each such work in the over-all Plan; and to bring up the material in each Report to date, wherever possible.

Not every Sub-Committee's Report is sufficiently large to make, more or less, a volume by itself, of uniform size, for this Series. In such cases two or more Reports will be combined, so as to maintain uniformity of size, get-up, and presentation of the material. The various Reports, it may be added, would not be taken in the order of the classification or grouping originally given by the Planning Commit-

tee; nor even of what may be called the intrinsic importance of each subject.

In view of the varying stages at which the several Reports are, for reasons of convenience, it has been thought advisable to take up for printing first those which are final, and on which the Planning Committee has pronounced some resolutions. Printing arrangements have been made with more than one Press, so that two or three Reports may be taken simultaneously and published as soon as possible so that the entire Series may be completed in the course of the year.

Two other Sub-Committees, not included in the list of Sub-Committees given above, were assigned special tasks of (1) preparing the basic ideas of National Planning; and (2) outlining the administrative machinery deemed appropriate for carrying out the Plan. These were unable to function for reasons already explained. The present writer has, however, in his personal capacity, and entirely on his own responsibility, published the "Principles of Planning" which attempt to outline the fundamental aims and ideals of a National Plan. This remains to be considered by the Planning Committee. Similarly, he has also attempted to sketch an administrative machinery and arrangements necessary to give effect to the Plan, when at last it is formulated, and put into execution. Notwithstanding that these two are outside the Scheme outlined in this Preface, they are mentioned to round up the general picture of the arrangements made for publication of the entire work up-to-date of the National Planning Committee and its several Sub-Committees.

The several volumes of Sub-Committee Reports, when published, will be treated as so many appendices to the Report of the parent body, the National Planning Committee. It is impossible to say when that Committee, as a whole, will be able to hold continuous sessions, review and resolve upon Sub-Committee Reports which have not yet been considered, and lay down their basic ideas and governing principles for an all over Plan, applicable to the country, including all the facts of its life, and all items making up the welfare of its people.

The disturbed conditions all over the country, and the Labour unrest that has followed the end of the War, has caused unavoidable delays in printing and publishing the

several volumes in the Series, which, it is hoped, will be excused.

In the end, a word of acknowledgment is necessary to put on record the aid received by the Editor in the preparation and publication of this Series. All those who are associated in the task,—members of the Parent Committee, or as Chairmen, Secretaries or Members of the various Sub-Committees,—have laboured wholly, honorarily, and consistently striven to give the best that lay in them for the service of the country. Almost all Provincial Governments and some States,—the latter twice in some cases,—have made contributions towards the expenses of this office, which have been acknowledged and accounted for in the Handbooks of the Planning Committee, published earlier. Suitable appreciation of these will be expressed when the Parent Committee makes its own Report. At almost the end of its task, the expenditure needed to edit, compile, and otherwise prepare for the Press, the several Reports, has been financed by a Loan by Messrs. Tata Sons Ltd., which, even when repaid, will not diminish the value of the timely aid, nor the sense of gratitude felt by the undersigned.

Bombay, 1st July 1947.

K. T. Shah.

**Note:**—In the Scheme of this Series, originally given, more than one Report was intended to be included in one volume in some cases. The combinations indicated in the circular, of the 20th of June 1947, had had to be modified as the printing of several Reports proceeded.

When about half the volumes were printed, it was found that that scheme would not give a fairly uniform series. The new arrangement is given on the page facing the title page. Some changes have had to be made in that list e.g., the separation of the two Reports on Public Health and National Housing, intended to be in one volume, are now in separate volumes.

Conversely, only the two Reports on Animal Husbandry and Dairying and on Fisheries were intended to be combined. As now decided, the Report on Horticulture is also included in the same Volume.

Again, the original combination of the Report on Mining and Metallurgy with that on Engineering Industries has been modified. The latter now combined with the Report on Industries Connected with Scientific Instruments, which was originally meant to be a separate volume, while the former is to be by itself.

31st January, 1948.

K. T. S.

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## CHAPTER I

The Sub-Committee on Crop Planning was appointed to deal with:—

- (a) Development of scientific agriculture, with proper attention to bring about a suitable balance between food crops (wheat, rice, millets, pulses etc.) and commercial crops (cotton, jute, tobacco, tea, coffee, oil seeds, etc.);
- (b) Fodder crops;
- (c) Organisation of the agricultural community so as to utilise most efficiently the time and labour of the population by establishing, encouraging and developing appropriate subsidiary industries dependent on agriculture;
- (d) Dissemination of technical information and practical demonstration of improved agricultural methods.

### **Initial Handicap.**

This Sub-Committee was among the few which did not do any work at all while the National Planning Committee was active from its inception in 1939 up to September 1940. Thereafter the work of the Parent Committee itself had to be interrupted and suspended for five years for reasons beyond the control of that body. But even after its more active resumption of work, following the release of its Chairman, in June 1945, and repeated intimation to all Sub-Committees to resume their work at whatever point it was left when the Committee had to go into cold-storage, and finish it as soon as possible, this Sub-Committee failed to respond.

One of the most important items, therefore, in planning scientifically National Economy of this country, a primary source of new wealth production, and the largest single field for employment, labour and capital has not received from the appropriate Sub-Committee the attention that is its due. Any claim to a planned economy in a country like India must be open to criticism, which overlooks the importance of Agriculture, of Crops and their coordinated place in the planned programme of national development.

Though the Sub-Committee concerned has left its task untouched, the intrinsic importance of the subject precludes its being left unattended to in this Series. No National Plan is possible, in the sense accepted in this Series, if agricultural crops which promised food for human sustenance, and raw materials of all manufacturing industry, are left out of the planned programme. An attempt is accordingly made in the pages that follow to review the existing situation of agriculture in India to-day, to examine its handicaps and consider its potentialities, to coordinate the results with the other sectors of the National Plan so as to attain the principal objective of planning—a steadily improving standard of living for all citizens as early and as effectively as possible.

This Volume, therefore, differs markedly from the others in this Series. It has no Introduction. And though a Summary of the latest Developments is to be found it is not so much with reference to what the Report may have said had one been prepared, but simply to bring the subject matter up-to-date as far as possible. The Summary, however, is not presented in a separate section as in other Volumes. The volume, in fact, is rather in a consolidated statement of the Crop position of the country under the latest developments, the ways and means of its improvement, and its correlation with other sectors of planned economy, than a report of a subcommittee of experts, edited and brought up-to-date by the Honorary General Secretary.

### **Method of Treatment**

The subject matter of this Volume has to receive separate treatment in a Volume by itself, as notwithstanding the close connection with other items of agrarian economy, the unique importance of agricultural production cannot be sufficiently emphasised if we make it a part of any other subject. A number of volumes has been devoted in this Series to the subject of Agriculture, or Agrarian Economy, in general, as part of India's planned National Economy. In all eight Sub-Committees had been appointed in the Agricultural Section of the National Plan, viz:—

Rural Marketing and Finance.

River Training and Irrigation.

Soil Conservation and Afforestation.

Land-Policy, Agricultural Labour & Insurance.  
Animal Husbandry and Dairying.  
Crops—Planning and Production.  
Horticulture.  
Fisheries (Marine and Inland).

and the Reports of most of these, whether Interim or Final, has a volume devoted to each. This is the most important of the entire group. These are mutually correlated subjects, though approached each from a different angle. It is, therefore inevitable that a certain amount of over-lapping and repetition should take place, especially when dealt with by a layman. The writer has, however, tried in this Volume to confine himself strictly to the subject proper of crops, their production and planning. That will be best brought out by studying the present position and reviewing proposed or expected developments in regard to the several crops as a result of the various projects undertaken by the Central or Provincial Governments.

This Volume, it must be repeated, is prepared by a layman,—from material available to and understandable by a layman. He is not a scientific student of agriculture, or one practically acquainted with the actual problems of land cultivation and development, including reclamation. He has collected and collated material used in this Volume from standard treatises and official sources, like Royal Commission Reports, and other Publications, both official and non-official, relating to Agriculture in India in general, as well as those especial aspects or items.

### **Present Position of Crop Production.**

In the past, official or scientific attention was scarcely paid to this branch of our National Economy; and when it was, it was not so much from the standpoint of scientific agriculture, as from that of getting the most regular and abundant revenue from land. Not until Lord Curzon had invited the great agricultural expert, the Danish Dr. Vockler, to study and advise on this great national asset; not until a large demonstration farm at Pusa had been established by the same Viceroy, did the science and technique of Agriculture, the conditions and requirements of land cultivation, its modernisation and rationalisation, begin to receive some attention from the quarters that mattered. Even then their interest was confined to land cultivation

proper, and not to the entire aggregate of problems included in our rural economy, and much less to the co-ordination and integration of agrarian economy with the other sectors of our National Economy. Not until the powerful voice of Mahatma Gandhi had been lifted in the cause of Village Uplift did the full proportions of this complex question attract the attention of the rulers and popular leaders alike.

Since the Bengal Famine of 1943, there has been a still more increasing attention being paid to Agriculture, not only because it is the source of supply, the most elementary want of man—food; not only because it is the principal industry of this country responsible for the largest portion of the national wealth, but also for providing the widest volume of employment to the largest number of this country. The food problem has ever since dominated all other problems of reorganised national economy. Notwithstanding this importance, however, the fact that the mass of the agricultural population is too poor and too backward to be vocal must be held responsible for the relatively scanty attention paid to the special handicaps of the agriculturist's principal means of livelihood. With the advent of the Adult Franchise and Responsible Government, the situation may change; but even then it would be necessary first to educate the masses into a full realisation of their handicaps and potentialities to be able effectively to exercise the full weight of their voting strength.

From the point of view of National Planning, Crop Planning has an importance, not only because land cultivation is the primary source of all new wealth; it is the only source of livelihood for over two-thirds of our people, and, therefore, mainly to be depended upon for improving the standard of living amongst our people. It is also the source of raw materials for the most considerable manufacturing industries already established in the country and those most promising for the future. It is notorious that the Standard of Living of the Indian masses is so poor that, on an average, hardly one full meal per day of the coarsest material and poorest quality, is available to about 70 per cent. of the population. Even this miserable pittance is not actually available to the peasantry proper. It is arrived at by distributing the total wealth produced in the country among the total population, and striking an average. The prevailing system of wealth distribution is such, however, that by far the larger proportion of the people gets much

less than the average,—not to speak of a fair share. Perhaps not even half of the average per capita income of the country falls to the lot of over two-thirds of the population. This means that not even one full meal a day, however coarse the material and however poor the quality, is available to the cultivating class.

If food, the most primary need of human life, is to be supplied in better and greater quantity; if the people's diet is to be full and balanced, it goes without saying that the produce from Agriculture must be very substantially increased within a prescribed time limit. If the indigenous production does not suffice, the food produced in the country will have to be supplemented by imports sufficient to ensure a decent standard of nutrition in the mere matter of food grains being available to the people. The policy of importing the balance of food required has its own dangers, even in normal times, to those who seek to attain national self-sufficiency in all matters of primary requirements. In a period of sudden emergency, like a war, imports on a large-scale may be unavoidable and may nevertheless be impossible for lack of shipping space and other such factors. As a matter of carefully planned economy of a country like India, it is politically necessary and economically advisable that we seek to develop national self-sufficiency in this behalf to the best of our ability.

The same must likewise be said in regard to the raw materials of the principal industries, whether already established or to be established under the Plan. But if these entrench for obtaining their raw materials upon land taken away from food stuffs, we may be faced with a serious dislocation or lop-sided growth of the National Economy that the Planning Authority cannot afford to treat with indifference.

## CHAPTER II

### Development of Scientific Agriculture.

The terms of Reference to this Sub-Committee require it, in the first place, to consider the room for developing scientific agriculture. This pre-supposes a number of conditions relating to the social and economic background as well as those relating to agricultural science proper, which are not all easy to analyse and exhibit in their proper perspective. Most of them, it may be added, are of man's own making. They are, consequently, capable of being modified by man. And even where they are the gifts of nature, like the chemical and physical properties of the soil, man's ingenuity and experience over long centuries during which this land has been in cultivation, has suggested many ways and devices by which the inherent deficiency of the natural endowment may be made good.

To achieve really scientific agriculture, which must also be most economical from the point of view of outlay and yield per unit, would require the institution of a standard economic unit of cultivation where all possible economies as well as scientific devices can be effected. Such a Standard Unit would necessarily differ from region to region, according to the nature of the soil, the quality of crops, the climatic and other conditions affecting the region. But that we must evolve and enforce a Standard Unit suitable for the most economic and scientific cultivation must be accepted as a **sine qua non** if we desire our agriculture to improve in yield qualitatively as well as quantitatively.

Another angle, likewise, from where a Standard Unit is to be viewed and established is the demand upon the unit for production, that is to say whether the unit is to be considered with reference to the need of a single cultivator or a family of cultivators or from any other larger standpoint. In many parts of India, under the British Regime, when Land Revenue Settlements were being made, little attention was paid to having, establishing or maintaining a truly economic unit suitable for scientific cultivation. A family of 4 or 5 was taken to be, if ever any thought was devoted to the subject at all,—the unit of demand which must be met by a unit of cultivation. Objectively, that was considered to be a satisfactory unit which could be culti-

vated by a pair of bullocks. This necessarily varied according as it was dry or wet land, and also according to the character of the soil. In the Deccan, for instance, it was taken to be 16 acres of dry land; while in Gujerat it might be much less. Under present day conditions, with modern agricultural machinery working; and with changing conception of the unit of demand to be the entire country, the unit area of cultivation, which would be found to be the most economic, and admitting of the fullest utilisation of the latest scientific developments and technical improvements, the Standard Unit of Scientific and Economic Cultivation would be much larger, running probably into hundreds, if not thousands, of acres. It is in view of these developments and our changed outlook in consequence that a wholesale co-operative reorganisation of India's agrarian economy has been proposed and explained. Whether that form of reorganisation, or the more directly collectivist form be adopted, the size of the unit will have to be substantially increased, if agriculture is not to be wasteful and unprofitable as it is rapidly becoming to-day. Even in the private proprietorial regime of landholding and cultivation, effective steps will have to be taken, not only to prevent further subdivision of our already microscopically small holdings; but also their consolidation and maintenance as such consolidated units, without any right to the holder to sell or mortgage any parcel which would reduce the standard size, and impair the economy of cultivation.

As the National Planning Committee has postulated; the aim of all planning is to attain as high a degree of National Self-Sufficiency, in all departments of the economic life of the country, as may be possible to attain. This ideal, as applied to Agriculture, would require the yield from the land to be such that all the food needs of the country would, as calculated in accordance with scientific basis of requirements for maintaining a human individual in health and physical fitness or working efficiency, be possible to meet from our own resources. At the same time other needs viz. those for the raw materials of developing Industry, which have also to be met from land, cannot be ignored for a progressive economy intent upon rapid and intensive industrialisation of the country. As in the case of food, the aim of National Self-Sufficiency demands that all the raw materials required for building up such industries must also be obtained from our own land. In India the land has yielded from time immemorial both food crops

and raw materials required for local industries in the required measures. Her self-sufficiency in both these regards was not disturbed till the establishment of the British Rule in the country, and the introduction of production for exchange instead of production for use. The fixed cash Land Revenue Settlement necessitated releasing crops at as early an opportunity after they had been harvested as possible, so that the State demand for revenue might be met without delay, and risk of the holder being evicted from his holding. This led to an increasing substitution of cash for food crops. The problem has, therefore, now arisen of restoring and establishing the balance between food and cash crops which before the days of the British Rule was non-existent. And further, as because of the increasing population as well as increasing sub-division of land, the yield per unit has diminished, the problem becomes more acute than ever.

The introduction of scientific agriculture, with due regard to the aim for National Self-Sufficiency, must, accordingly, not only make good the shortage we are at present experiencing in the matter of food; but also the quality as well as the quantity of raw materials that the existing or new industries may require in the country. Our deficit in food requirements today is due to other factors besides the steadily diminishing yield from the land actually in cultivation. Raw materials of industry cannot be said as yet to show any shortage as compared to the demand of the industries that have grown up in recent years. But these Industries have grown without any scientific plan, or without any coordination in the aggregate claims of a self-sufficient National Economy. It is, therefore, premature to say whether the existing volume of raw materials raised in the country would suffice for the expanding industry which must inevitably result in planned economy pursuing the ideal of National Self-Sufficiency. As has been observed more than once in other volumes in this Series, there are two criteria by which the progress of industrialisation in the country may be judged:

- (a) A country would be self-sufficient in proportion as its own demand for finished goods is met from its own resources of industrial or agricultural production, or
- (b) a country would be self-sufficient if at least all its own raw materials may be worked up within



its own frontiers with the industrial equipment it has got or can procure.

In both cases the limits are by no means rigid. The local demand may grow in proportion as the Plan succeeds and the National prosperity is raised. What is perhaps today the country's total requirement in regard to the products of Cotton Textile Industry for instance, may not be considered sufficient in a civilised standard of living for the people. Hence, if the existing production of that raw material is sufficient to produce within the frontiers of the country all the clothing required, with a progressively improving standard of living, this output may not be found sufficient to meet the rising demand. Detailed consideration of particular crops, and the place of each in planned economy aiming at national self-sufficiency in every sector must await the appropriate section of this Volume where some consideration is given to that aspect.

It may be added here, however that the ideal of National Self-Sufficiency for a country like India is not necessarily incompatible with the modern ideal of world cooperation and international brotherhood. From the point of view of foreign trade, or rather from the point of view of national economy as well as international relations, this is an item which will have to receive much closer consideration by the Planning Authority from a variety of angles than seems to have been the case so far.

### **Modern Science and Technique in Indian Agriculture Today**

Let us consider a little more specifically the place of modern physical science in agriculture. Reporting on the work of the Imperial Council of Agricultural Research (1937) on the question of applying science to Crop Production in India, Sir John Russel says:—

“The purpose of Agriculture is to obtain food and raw products by the cultivation of land; and its distinctive feature is that the process can go on indefinitely without deterioration in contra-distinction to the exploitation of mineral resources which is possible only once. All agricultural scientific services are set up with the double purpose of educating the cultivator so that he may better understand the natural forces with which

he is dealing, and of increasing his means of attacking the serious problems with which he is confronted”.

Cultivation of land has been practised in most parts of India from time immemorial; and yet her soil cannot be said to have been exhausted. That is to say, the inherent chemical and physical properties of the land still remain after centuries of use; and are capable of yielding crop after crop,—if only due care is taken to replenish and maintain the soil, and provide all the necessary accessories for good cultivation. The climatic and other factors affecting production also remain practically unchanged. The technique of tilling and the general knowledge used are the same as was followed in the West for centuries. And yet the decline in yield is so considerable,—or rather the hiatus between the total production in India today of foodgrains and raw materials of industry and the country's aggregate demand so great,—that the problem assumes daily more serious dimensions. Necessarily, our only recourse is to modern Science and the technique improved by its aid, to bridge this gulf, and bring us nearer our objective than would otherwise be the case.

The main objectives of land cultivation are:—

Production of grain for human food, fibre for clothing, and oil for burning. Little provision is, however, made for food for animals except straw or stalks of the grain crops, and such wild vegetation as may be available for grazing. But the adequacy and sufficiency of the yield for human, animal or industrial consumption on a decent standard has not been considered; and much less coordinated with the attainment of a predetermined objective.

Land is thus a perennial source of new wealth production. Apart from the actual removal of the soil by floods or other agency, there is no loss of the basis, so to say; and so no reason why the system should ever fail. The quality or condition of this land may be judged from the fact, that some 11 persons are sustained on 10 acres of land, though, according to the modern Western standards more than double this area is needed. But against this are heavy disadvantages e.g. low unit yield, poor fodder etc. That, however, is due to other factors e.g. excessive fragmentation and scattered character of holdings, which make the unit yield comparatively low. The villages remain poor

in consequence, and the general standard of living goes down like a stone. The ordinary cultivator's diet is practically all grain, which lacks variety and is poor in animal products. One of the most difficult items in Crop Planning would thus be the raising of such crops, in such quantity and of such quality as to provide a well-balanced diet with an adequate quantity of calories, proteins, fats and vitamins. This is mainly a matter of time and changing technique. In the West it took some 70 years to change over from the old traditional method to the modern scientific system of Agriculture.

In India perhaps we may take half this time if the intensive efforts for rapid improvement of technique in cultivation as also its prerequisites now being planned are put into effect. As most observers have noted, the Indian cultivator compares quite favourably, in regard to the knowledge of his subject and mastery of technique, with any other peasant in any other part of the world. It is, therefore, no mere form of words but a fact that "the wealth of India lies in the villages". Improvement of village life is, accordingly, the greatest need of India today. And that improvement can be effected by making more easily available the scientific advances of a later day for actual application in the cultivation of land, as well as of other essential amenities, services or utilities for the benefit of the agrarian population.

For securing full and proper application of the latest scientific knowledge, and improvements in technique to actual cultivation, the authority referred to already—Sir J. Russel in his Report to I.C.A.R., outlines three stages viz:—

- (1) acquisition and extension of knowledge, which can best be done by endowing Universities for research in these problems without any needless restrictions or limitations;
- (2) experimenting on the land actually in cultivation, or on Demonstration Farms, to show the advantages of the methods and rules of science obtained by careful study and research of the present-day problems of the cultivator;
- (3) making available to the actual cultivator the knowledge thus gained.

The actual acquisition of the basic scientific knowledge may be attained in the University laboratory. But its pro-

per use can only be made, to the advantage of the principal party concerned, in the Experimental Stations and Demonstration Farms. Good work is, no doubt, done at many of these stations. But, generally speaking, it suffers from some defects. It is there, according to Sir John, too diffuse. In many cases it is conditioned too much by the laboratory requirements; and not to those of the field and the growing crops and, generally, it is restricted to the particular Experimental Stations, itself. The benefit of the experiments made at these Stations is not easily available to the working agriculturist. If the cultivator proper is really to benefit, it is necessary that the new methods and devices be actually tried out on private lands in the neighbourhood, or other stations in the province, so that all factors be fully taken into consideration. In the former case it would be possible only to demonstrate the benefit of some single improvement, like better seed or a more efficient implement. For testing and proving to the agriculturist several improvements simultaneously in different branches, it would be better to try them out on the entire holding or perhaps a number of holdings.

### CHAPTER III

#### Crop Production Today

More exact or official statistics are adduced later on to give an indication of the volume of agricultural production in India. For our present purposes let us take the position as it was before World War II. The agricultural production of British India in 1939-40 may well be estimated in monetary terms at some 1500 crores at the then level of prices. In a total annual wealth of some Rs. 2500 crores from all sources of all kinds, this is no small amount. Proper attention to its development and improvement by all possible means cannot but claim the fullest attention from those in charge of the destinies of the country. The Government of India, as it was before August 1947, could not do much towards radically reorganising and reconditioning land cultivation, as it involved many complex social as well as economic and technical questions, though they and its officials were, however, no less aware that the greatest source or means for improving the Standard of Living of the people in India lay in land tilling, and that the production from this source was very poor as compared to other countries. Though the soil and other conditions affecting his occupation were not particularly deficient in India, for reasons outside the control of the agriculturist, the volume of agricultural wealth produced in the country had not kept pace with the increase in population during the present century. The result is that there has been a progressive deterioration in the standard of living, so far even as food materials were concerned. The following figures taken from Sir J. Russel's Report on the Imperial Council of Agriculture amply illustrate this point.

#### Area per head of population. (British India)

	1903-04 1907-08	1908-09 1912-13	1913-14 1917-18	1918-19 1922-23	1923-24 1927-28	1928-29 1932-33
Net area sown, acres per head.	0.883	0.906	0.918	0.879	0.868	0.841
Acres under food crops per head.	0.829	0.862	0.873	0.833	0.803	0.785
Acres under food crops omitting sugar, per head	0.818	0.852	0.862	0.822	0.792	0.774
Acres under non-food crops per head	0.053	0.043	0.045	0.045	0.065	0.057
Populations : Millions	237.6	243.8	245.3	246.9	259.2	271.5

The same situation is manifest, if anything more painfully in the latest Census returns of 1941, Dr. Burns in his work on Technological Possibilities of Agricultural Developments in India p. 21 gives the comparative position to be:—

All major Food-Grains Production (in million tons)		Acreage per head under food crops, including sugarcane, vegetables, fruits, condiments & spices.	
1919-20	54.5	Census, 1911	0.83
		„ 1921	0.86
		„ 1931	0.79
1919-20 to 1941-42 (average)	47.8	„ 1941	0.67*

In another Volume in this Series reference has been made to the effects of such circumstances as the law of equal inheritance, the consequent fragmentation of land in the country, and the increasing smallness and uneconomic character of the unit of cultivation, the recurrence of famines due to lack of sufficient water supply, the disadvantage of money economy represented by the demand for land revenue in cash which led to a disproportionate emphasis on commercial or saleable crops in preference to food crops, the drive for exports which had to be stressed to meet the demand for Home Charges,—all these were factors leading to a progressive impoverishment of the agriculturist in India. In consequence there has come into being a shortage of food grains, which has been progressively increasing, as shown by the following figures taken from the Food Grains Policy Committee Report:—

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\* The 1941 figure has been calculated from the 1941 Census on the basis of the acreage for 1941-42. The figure in the last column must be considerably less since the Partition of the Country on August 15, 1947, and because of the increase of population since 1941. In 1945-46 the region now called the Union of India had a total area under Food Crops excluding sugarcane, of 166.66 million acres. Taking the present population of that territory to be at least 360 million souls, the area per person under Food Crops works out at less than half an acre.

Year	Aggregate yield of seven foodgrains.  (Crop Years) Thousand tons.	Net quantities of food- grains* product imported (+) or exported —)  (Financial Years)
1935-36	49,885	+ 1,742**
1936-37	55,481	+ 1,246**
1937-38	54,324	+ 629
1938-39	49,584	+ 1,044
1939-40	53,061	+ 2,221
1940-41	50,173	+ 993
1941-42	51,817	+ 431
1942-43	53,928	— 361***

\* Including pulses.

\*\* Figures prior to separation of Burma are not strictly comparable with later figures.

\*\*\* More up-to-date figures are given later on in this volume.

In spite of that impoverishment, however, agriculture still remains the largest single source of producing new wealth in the country and reveals great potentiality for further development so as to meet all the food and raw materials need of the country in a planned economy. As such it demands the attention of all those concerned with the planned development of National Economy which remains still a desideratum.

To appreciate fully the scope for planned development in this most important source of wealth production in India, let us examine the existing situation in the matter of Crop Production. At the outset it must be observed that the statistical data available in any department of our national economy are exceedingly meagre, unreliable and out of date; and the statistics relating to agriculture suffer from this handicap more perhaps than any other field, as the cultivator is ignorant and unable to supply proper information. Such as they are, however, the following tables will suffice to give some idea of the situation.

In considering the crops position and prospects, let us begin with the following basic statistics. (See the Table inset). These tables have been compiled from several sources, principally the Statistical Abstract (Decennial), Report of the Food Grains Policy Committee, 1943-48, Report on the work of the Imperial Council of Agricultural Research in applying science to Crop Production in India by Sir John Russel, 1937, and Technological Possibilities of Agricultural Development in India, by Dr. W. Burns, 1944, Estimates of Area and Yield of Principal Crops in India, 1936-46—issued by the Economic and Statistical Adviser, April, 1948, and the Indian Year Book, 1947. (Table inset).

A complaint has been made in this Series more than once about the unreliability, or obsolete character, of the statistical material collected, compiled and published in this country. Nowhere is the force of this complaint so great as in matters relating to agriculture. It is, of course, never easy to estimate the Agricultural,—particularly Food,—production of any country. The larger its size, the greater the variety of its crops or soils, the greater the difference between the yield per unit in different parts of the country.

In India the illiteracy of the people and their indifference make it impossible for them to keep proper accounts or records. The subordinate officials making such records are scarcely better. The presence of a foreign Government had made the average cultivator more than ever suspicious of official enquiries regarding his produce, especially as the volume or value of his produce determines the land revenue—or the tax burdens of Government upon him.

It is very likely, therefore, that while the area actually under cultivation may be fairly well known, so far at least as the Provinces of the Indian Union are concerned, the actual yield of this area is a matter largely of conjecture. The usual method of getting the figures relating to production is: to multiply the area under crops by the "standard-out-turn", and the result to be further multiplied by the "seasonal conditions". The "standard out-turn", it may be added, is not the average yield calculated for a number of years but the model value over a long period. This is, therefore, bound to be affected by the high or low yields of particular years. Moreover, the "standard out-turn" has



# **AGRICULTURAL AREA (FIGURES IN MILLIONS OF ACRES)**

* Years -	1927-28	1931-32	1936-37	1938-39	1939-40	1940-41	1941-42	Indian Union	*** 1942-43 Paki- stan	Hydera- bad	Total	Indian Union	*** 1943-44 Paki- stan	Hydera- bad	Total	Indian Union	*** 1944-45 Paki- stan	Hydera- bad	Total	Indian Union	*** 1945-46 Paki- stan	Hydera- bad	Total
**																							
1 Area by professional survey	670.0	608.8	511.9	512.6	512.7	512.9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
**																							
2 Area according to village papers	—	—	511.4	511.8	511.9	512.0	512.1	403.2	110.0	—	513.2	403.0	109.9	—	512.9	402.6	110.0	—	512.6	403.0	109.6	—	512.6
3 Area under Forest	87.0	88.5	67.1	68.1	68.1	68.2	68.3	62.8	5.3	—	68.1	62.6	5.3	—	67.9	62.1	5.3	—	67.4	62.4	5.3	—	67.7
4 Area not available for cultivation	149.6	145.6	93.5	91.8	89.3	86.7	91.0	62.9	27.6	—	90.5	62.8	27.6	—	90.4	62.4	28.3	—	90.7	62.4	27.9	—	90.3
5 Other uncultivated land excluding current fallows	155.4	155.0	92.2	94.1	97.1	97.8	92.2	69.4	22.1	—	91.8	68.9	22.0	—	90.9	68.1	21.4	—	89.5	68.5	21.1	—	89.6
6 Fallow land	51.0	49.0	44.8	48.3	47.3	45.2	47.1	35.3	10.5	—	45.8	33.8	9.7	—	43.5	35.0	8.4	—	43.4	37.9	8.9	—	46.8
7 Net Area sown	223.8	228.8	213.7	209.4	209.9	213.9	213.2	171.8	44.0	—	215.8	173.8	45.1	—	218.9	174.0	46.4	—	220.4	170.8	46.2	—	217.0
8 Irrigated Area	43.3	48.7	50.1	53.6	55.0	55.7	56.7	36.8	18.9	—	55.7	37.5	19.5	—	57.0	38.2	19.3	—	57.5	39.2	20.3	—	59.5
<b>Area Under Food Crops</b>																							
@																							
(a) Total Food Grains	196.6	205.0	189.3	186.2	187.0	187.1	192.3	150.0	38.0	14.0	202.0	153.0	40.0	14.0	207.0	169.0	43.0	14.0	226.0	166.2	41.0	12.1	219.3
(b) Sugar	3.0	3.0	1.3	3.1	3.6	4.5	3.5	3.0	0.5	0.3	3.53	4.0	0.6	0.3	4.63	3.0	0.6	0.6	3.66	3.1	0.6	0.5	3.75
@@																							
(c) Other Food Crops	7.8	8.3	7.0	6.7	6.7	6.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total Food Crops —	207.4	216.3	200.6	196.0	197.3	198.3	195.8	153.0	38.5	14.03	205.53	157.0	40.6	14.03	211.63	172.0	43.6	14.06	229.66	169.3	41.6	12.15	223.05
<b>Area Under Non Food Crops</b>																							
@@@																							
Total Non Food Crops —	42.7	39.2	47.4	47.4	47.1	49.5	50.1	32.7	8.0	0.06	46.76	33.3	7.5	9.06	46.86	30.0	7.2	6.03	43.23	30.1	6.9	6.6	43.6
Total Area Under Food and Non Food Crops —	250.1	255.5	248.0	243.4	244.4	247.8	245.9	185.7	46.5	20.09	252.29	190.3	48.1	23.09	261.49	202.0	50.8	20.09	272.89	199.4	48.5	18.75	266.65

\* The figures in this Table are for 20 years. For the first half they are at intervals of five years, while those after 1938-39 are for every year.

\*\* Figures of the total area, and all those relating to area before 1935, differ considerably from the figures under the same heading for later years, due to the separation of Burma from India. This separation from what used to be called British India reduced the total area of the latter by some 155 million acres in round terms, or about 22½ per cent. In some later reports, however, the correction due to this factor has been made, and then the figures become comparable. The Partition (1947) of India, into the Indian Union and Pakistan, has further reduced the total area by some 110 million acres, or another 22½ per cent of the remainder after separation of Burma. The Indian Union has now a total land area of some 62 per cent of the area as it was before the separation of Burma.

The difference in the figures under Items 1 and 2 is explained by the difference in the headings.

\*\*\* Since the year 1942-43, the figures for the Indian Union and Pakistan have been compiled from a publication of the Economic and Statistical Advisory Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, entitled "Estimates of Area and Yield of Principal Crops in India 1936-1946". The figures for each Dominion are given separately, as also the total of both, to facilitate comparison with previous years. Apparently, the figures of the Indian Union and of Pakistan do not include those relating to the States which have acceded to either Dominion, though checking up the totals, it seems as if the Area figures do include those of the States which have acceded to either Dominion. The figures relating to Hyderabad, which has so far not acceded to either the Indian Union or Pakistan, have been given separately.

@ (1) Total Food Grains include —  
For the Years 1927-28 to 1945-46: Rice, Wheat, Barley, Jowar, Bajra, Ragi, Maize, Gram and other grains and pulses.  
Years 1941-42 to 1945-46: Exclude other grains and pulses.

@@ (2) Other Food Crops include —  
For the Years 1927-28 to 1940-41: Fruits, Vegetables, Condiments, Spices, etc.  
Figures for 1941-42 to 1945-46 are not given.

@@@ (3) Total Non Food Crops include —  
For the Years 1927-28 to 1945-46: Oilseeds (Sesamum, Rape and Mustard, Linseed and other Oilseeds), Coffee, Tea, Cotton, Jute, other Fibres, Indigo, Opium, Tobacco and Fodder Crops.

For the Years 1941-42 to 1945-46: Figures for other Fibres, Indigo, Opium, Fodder Crops are not given.



not been re-determined or checked up for a long time. The possibility of error, therefore, due to new factors affecting the yield cannot be neglected.

The "seasonal conditions" factor is also a matter of guess, though some degree of definiteness or standardisation has been achieved in assessing that factor. The effect upon yield of several factors, like lack of water supply, manure, crop pests, etc. is yet another guess. But if all these are checked year by year by the same method and officer, the result would be much more dependable.

The available statistical data, it may also be added, are usually two years out of date by the time the public is in a position to use them. With changes such as have taken place in recent times, not only because of the War, but also because of the wholesale Partition of the country, such obsolete material may be worse than useless, as it would be misleading. In the foregoing Tables however, nothing better can be given,—except in rare cases. The figures may, accordingly, be taken with such reservation as these limitations make inevitable. Discrepancies, due to differences in the method of computation, e.g. "area according to survey", and that "according to village papers", also make a further degree of confusion, which is unavoidable. All that the student of the subject can do is to give what figures are available, and guard the reader against confusion by adding such preliminary warnings before as have been given above. The earlier figures, i.e. those before 1935-36 are not comparable, as they include Burma which separated in 1935-36. Unless corrected, those figures would show a large discrepancy.

The total area under food crops has remained more or less steady in the last 40 years. This is, of course, after making allowance for the loss of area in Burma, and last year in the new Dominion of Pakistan. The net area sown is not increased substantially, especially in proportion to the population to be served by that area, as has been shown on a previous page. It gives the population only up to 1933 since when there has been a very considerable increase in the total population of India. According to the 1941 census, the population in India was nearly 39 crores, without counting Burma. At the rate at which the population has grown in the last two decades, it would not be surprising if the total population of India as it was before August 15th, 1947, would be somewhere near 45 crores.

Allowing for 8 crores in Pakistan territory, the total population in the Union of India including Hyderabad would still be somewhere near 37 to 38 crores in 1948.

Against this, the total area is about 410 million acres in the Union of India, while the area under actual cultivation is about 212 million acres. And even counting twice over the area sown more than once, the area under Food Crops per head in 1948 is less than .7 acres.

As the Report of the Food Grains Policy Committee (1943) has stated:—

“Taking India as a whole, the physical resources of this Sub-Continent remain unimpaired, though no doubt the efficiency of agriculture is to some extent interfered with by the shortage of producer goods e.g. iron for the repair and maintenance of implements. . . . . It is not in a deterioration of productive conditions—taking India as a whole that the key to the present difficulties is to be found. they lie elsewhere. If physical conditions in India as a whole had undergone a serious change for the worse it would be easier to explain the present circumstances: in fact, these are the results of a complex of circumstances. The Report sums these up as follows:—

“The food crisis has been accentuated on the Supply Side:—

- (i) by the fact that certain normally deficit areas (Bombay and Malabar Coast) have been deprived of a disproportionately large part of their normal supplies by the cutting off of Burma imports,
- (ii) by the reduction of normal supplies (and the destruction of stocks) in the normally surplus districts of Bengal due to the cyclone of October 1942 and by the widespread disease in the Aman paddy crop of Western Bengal,

It has been accentuated on the Demand Side, by:—

- (i) the combination of an adverse supply situation in Bengal with an adverse psychological situation due to proximity to the War Zone,
- (ii) a diminution in the relative magnitude of the marketable surplus through increased holding

and/or increased consumption by the cultivator who in the depression period was probably eating less than was requisite for full efficiency, which reacts with disproportionate effect upon the urban consumers as a whole,

- (iii) probably some increase in per capita consumption by those in receipt, for the first time, of higher money incomes,
- (iv) a decline in the absolute size of the rice carry-over,
- (v) some withholding from sale of available stocks for "investment" and "black market" reasons,
- (vi) an increased demand, which could not always be satisfied and therefore exerted an altogether disproportionate influence on prices, for personal and family "security" reasons".

The total area in what was called British India is somewhere about 513 million acres, of which about 212 or about 42 per cent. is under cultivation. This has varied since the separation of Burma, from a maximum of 220.4 million acres in 1944-45 to a minimum of 209.4 million acres in 1938-39. More land has come into cultivation, probably as the result of high prices and the "Grow-More-Food Campaign", which in the War years was very intensive. Almost the whole of this increased area sown seems to be due to the increase in area under irrigation, which has risen from 50.1 million acres in 1936-37 to 59.5 million acres in 1945-46 i.e. an increase of 8.4 million acres. Certainly the total of land lying fallow varying from 43.4 million acres to 46.8 millions in 1945-46 has not substantially diminished even when the "Grow-More-Food-Campaign" was at its highest. Other culturable waste has varied from 97.8 in 1940-41 to 89.8 in 1945-46 or a reduction of over 8 million acres.\*

Large-scale Irrigation Works are thus the main cause of this increase of area under cultivation. They have been a feature of Government enterprise, ever since the advent of Provincial Autonomy. A still larger expansion in this direction has been planned by the Union of India since the

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\*The position, after the Partition of the country, in regard to the area under principal crops, is given in the table on the next page.

**AREA UNDER PRINCIPAL CROPS**  
(1945-46) (In thousand acres)

	Indian Provinces	Indian States	Pakistan Provinces	Pakistan States	Hydera- bad	Total
<b>Food-Grains.—</b>						
Rice	52,859	3,834	22,610	10	1,419	79,732
Wheat	17,240	6,821	9,612	819	485	34,977
Jowar	21,240	9,958	924*	126	7,555	39,803
Bajra	11,601	10,133	2,223*	164"	1,263	25,384
Maize	5,506	1,910"	964*	25"	369	8,774
Ragi	2,918	1,916	—	—	—	4,834
Barley	6,240	—	492	5	7	6,744
Gram	14,036	54	2,925	22	1,087	18,124
<hr/>						
Sugarcane	2,997	148	620	1	59	3,825
<hr/>						
<b>Oilseeds —</b>						
Seasamum	2,711	397	190	(c)	638	3,936
Groundnut	6,414	1,423	(c)	—	2,436	10,273
Rape & Mustard	4,201	116	1,165	47	6	5,535
Linseed	2,515	229	74	—	516	3,334
Castor Seed	381	238	5	—	807	1,431
<hr/>						
<b>Fibres—</b>						
Cotton	6,408	2,786	2,884	435	2,155	14,668
Jute	550	30	1,842	—	—	2,422
<hr/>						
<b>Beverage .—</b>						
Tea	635	95	109	—	—	—
Coffee**	126,799	85,028	—	—	—	211,827
<hr/>						
Tobacco	838	103	197	1	81	1,220

\*\* Figures in units.

\* Certain areas which were hitherto non-reporting for this crop, started reporting area and yield for the first time in 1945-46

" Due to larger number of States reporting for this crop

(c) Below 500.

Source—Estimates of Area and Yield of Principal Crops in India 1936-46—issued by the Economic and Statistical Adviser, April 1948.

Partition of the country; and a much more substantial addition to the land available for cultivation and the area actually sown is likely to result, in proportion as the Multi-purpose River Training Projects take effect.

If this device is found of so direct an advantage in increasing the total surface under cultivation, as well as the volume of crops raised thereon, it would be worth considering whether Irrigation of a more appropriate character, such as wells, tanks, and reservoirs suitable for bringing water to every individual field, in the required quantity and at the proper time, would not serve the purpose still better. At the present time the area irrigated by wells or tanks is a comparatively small fraction of that served by large Irrigation Canals. Disproportionate attention is also paid, in planning and executing larger canals, to the Commercial or profit earning aspect of the enterprise. Wells or tanks, however, would not prove a losing venture, even on that basis.

The possibility, however, of such sub-soil water raised to the surface by wells suitably spread all over the land, needs to be much more seriously investigated than has been the case while the authorities concerned were hypnotised by the construction of imposing, grandiose large-scale works. The large volume of land remaining today outside cultivation, aggregating over 25 per cent. of the total land surface in the Indian Union, would be possible to utilise effectively only by means of well and tank irrigation rather than by river irrigation. Given the serious shortage of food supply in the country; given also the reduction of the actual surface of the land owing to the Partition of the country; and given above all a steady increase in the population in the Indian Union, the problem becomes much more urgent than has been realised so far. Imports of food stuffs from abroad, always a costly luxury exposed to many risks of war or international tension cannot,—and must not,—be depended upon to make good our present deficit. Every aid, therefore, which helps to increase the country's own food supply, raised within her own frontiers, must be emphasised as much as possible.

A great potential addition to the land available for cultivation is to be found in the figures of culturable waste and fallow land, which, between them, amount to 155 million acres or 31 per cent of the total area of the country. Even if the whole of this area may not be suitable for cul-

tivation; even if some portion has to remain fallow because of the necessity to recoup the physical and chemical properties of the soil exhausted by cultivation, considerable chunks can nevertheless be added, if a planned programme of intensive land reclamation and land development is taken in hand. As shown above, already some 8 to 10 million acres have been thus reclaimed and added to the area under the plough; and there is every ground to believe that between 50 to 75 million acres can be actually added from this source alone to the total area cultivated.

This land is not found in a single stretch in any large extent. It lies scattered all over the country in relatively small parcels in the different units. Nevertheless, each such parcel is, or can easily be made larger than the average holding under existing conditions, and as such made much more economical in cultivation than the actual farming today.

The cost—average as well as aggregate,—of reclaiming such land and bringing it under the plough is difficult to estimate. It must vary from unit to unit. Nevertheless, for the purpose of a comprehensive National Plan, and subject to wide margin of variation, ways and means in other Volumes in the Series have been suggested. The most notable is that suggested in the Volume dealing with Land Policy, which could bring such land into cultivation and organise its tilling in such a manner that all present-day handicaps of fragmentation, land revenue demand, money-lender's claim, rent charge of proprietors, may be avoided, not only in the initial years but for all time. A Universal Cooperative Organisation of the type suggested in the Report on Land Policy for all purposes of agrarian life, coupled with the prohibition of any subsequent dismemberment of such standard economic units, would make such land far more productive per unit than is the case today. If we take half of this area as likely to be reclaimed and added to cultivation in 10 years and assume it on an average to produce the same quantity and quality of crops, as is the case in the land actually under cultivation, there would be gross addition to the total crops of some 50 per cent and probably much more than the present volume.\*

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\* After a careful consideration of the matter, we consider that the country must set itself a goal of increasing production by 10 million tons annually, as soon as possible with a view to placing the food economy on a sound footing.



**STATEMENT SHOWING YIELD OF PRINCIPAL CROPS IN INDIA.**  
(In thousands of:—)

		1927-28	1931-32	1936-37	1938-39	1939-40	1940-41	1941-42			1942-43				1943-44					1944-45						1945-46				
									Indian Union	Paki- stan.	Hydera- bad	Total	Indian Union	Paki- stan.	Hydera- bad	Total	Indian Union.	Paki- stan.	Hydera- bad	Total	Indian Union.	Paki- stan.	Hydera- bad	Total	Indian Union.	Paki- stan.	Hydera- bad	Total		
Foodgrains																														
Rice	(Tons)	28,234	33,001	26,099	25,364	25,734	22,191	25,331	19,377	6,033	466	24,876	20,357	9,848	436	30,641	19,130	8,584	448	28,162	17,983	8,209	480	26,672						
Wheat	"	7,791	9,024	10,764	10,752	10,767	10,005	10,037	6,819	4,075	198	11,032	6,280	3,404	77	9,741	6,791	3,688	72	10,551	5,800	3,126	82	9,038						
Jowar	"	—	—	—	6,777	6,591	7,091	6,863	4,708	269	1,724	6,701	5,367	224	1,238	6,829	5,459	262	1,221	6,942	4,678	224	899	5,801						
Bajra	"	—	—	—	2,581	2,474	3,076	3,077	3,134	661	220	4,015	3,095	463	166	3,724	3,008	518	190	3,716	2,589	514	92	3,195						
Maize	"	—	—	—	1,979	2,223	2,196	2,015	1,978	378	52	2,408	1,911	365	52	2,328	2,153	461	53	2,667	2,024	431	28	2,483						
Ragi	"	—	—	—	1,728	1,729	1,854	1,845	1,771	—	—	1,771	1,764	—	—	1,764	1,638	—	—	1,638	1,170	—	—	1,170						
Barley	"	—	—	—	2,085	1,984	2,265	1,991	2,029	188	1	2,218	1,896	159	2	2,057	2,129	181	1	2,311	1,957	129	1	2,087						
Gram	"	—	—	—	3,468	3,294	3,355	3,131	3,416	584	87	4,087	2,763	548	60	3,371	3,140	640	89	3,869	3,029	626	109	3,764						
Total Foodgrains —		—	—	—	54,734	54,796	52,033	53,790	42,232	12,188	2,688	57,108	43,413	15,011	2,011	60,155	43,448	11,334	2,074	59,856	39,290	13,259	1,661	54,210						
Sugarcane	(Tons)	3,217	3,975	5,403	4,590	4,661	5,807	4,371	4,370	632	74	5,076	4,969	758	121	5,848	4,614	752	115	5,481	4,430	868	118	5,416						
Oilseeds (Edible & Non edible)																														
Sesamum	(Tons)	543	476	465	416	415	433	414	382	34	41	457	366	38	43	447	312	40	41	393	308	34	46	388						
Groundnut	"	2,424	2,268	3,501	3,148	3,165	3,702	3,586	2,239	(a)	619	2,858	2,748	(a)	1,075	3,823	3,095	(a)	761	3,856	2,718	(a)	748	3,466						
Rape & Mustard	"	840	1,025	1,021	1,120	1,116	1,094	1,089	751	319	(b)	1,070	689	231	1	921	824	209	1	1,034	714	205	(a)	919						
Linseed	"	348	416	461	466	466	432	361	347	17	46	410	338	15	28	381	344	12	36	392	310	11	42	363						
Castor-seed	"	138	146	104	97	97	105	91	63	1	83	147	75	(a)	65	140	77	(a)	54	131	66	(a)	57	123						
Total Oilseeds —		4,293	4,331	5,552	5,247	5,259	5,766	4,541	3,782	371	789	4,942	4,216	284	1,212	5,712	4,652	261	893	5,806	4,116	250	893	5,259						
Fibres—																														
Cotton	(bales of 400 lbs each)	5,661	4,678	5,722	4,909	4,909	5,903	6,223	2,590	1,616	488	4,702	3,061	1,633	565	5,259	1,920	1,407	253	3,580	1,858	1,411	261	3,530						
Jute	"	10,188	5,542	6,819	12,547	13,172	5,408	5,460	1,746	7,301	—	9,047	1,541	5,449	—	6,990	1,236	4,953	—	6,189	1,556	6,235	—	7,791						
Total Fibres —		15,849	10,220	12,541	17,456	18,081	11,311	11,683	4,344	8,917	488	13,749	4,602	7,082	565	12,249	3,156	6,360	253	9,769	3,409	7,846	261	11,316						
Rubber	(lbs)	26,042	20,117	32,297	31,391	31,391	35,530	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—						
Indigo	(Cwts)	10	10	7	5	5	11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—						
Beverages —																														
Tea	(lbs)	390,919	394,083	430,250	452,596	452,596	468,881	501,087	490,021	73,846	—	563,887	497,003	76,771	—	573,774	447,904	63,485	—	511,389	501,661	73,330	—	574,991						
Coffee	(,,)	35,563	33,614	33,516	@	34,822	28,452	35,772	32,514	—	—	32,514	34,180	—	—	34,180	34,600	—	—	34,600	50,400	—	—	50,400						
Tobacco	(Tons)	—	—	—	489	476	468	491	278	138	15	431	240	121	15	376	310	88	7	405	312	93	19	424						

**Sources—**

Figures for 1927-28 and 1931-32 are taken from the Statistical Abstract for British India 1927-28 to 1936-37. (Estimated Yield) p 458-459

Figures for 1936-37, 1938-39, 1939-40 and 1940-41 are taken from Indian Year Book 1947 p 332

Figures for 1941-42, 1942-43, 1943-44, 1944-45 and 1945-46 are taken from 'Estimates of Area and Yield of Principal Crops in India, 1936-1946' issued by the Economic and Statistical Adviser, April 1948"

Figures for 1938-39 to 1940-41 for Jowar, Bajra, Maize, Ragi, Barley, Gram are taken from "Estimates of Area and Yield of Principal Crops in India 1936-46".

And figure for Coffee for 1940-41 is also from the same source

(a) below 500

(b) 500

(c) incomplete

@ figures yet not available



As will be pointed out later, for a reasonable standard of nourishment to be guaranteed and made available to every citizen, the total food requirement of the Union of India, taking its present population at roughly 37 crores, would be 60 million tons. The land now produces 55 million tons of food supply including sugar. Hence, if we can bring about this addition, the existing deficit may be filled up without recourse to any imports, and even a surplus made available for export. India need not starve even if confined to her own resources in the matter of food supplies.

The extension of Irrigation Works further, not only in regard to large-scale canalisation of the principal rivers but also in the more appropriate forms of village tanks, reservoirs, or wells, would result in the yield per unit being very materially increased. It is a matter of sound organisation and economic working. These being guaranteed a total crop production of 100 million tons is an easy possibility realisable in less than a decade.

\*Analysing the area figures given in the Table appended before, still further it may be noted that —

Of the total area, that under Food Grains has varied from 189 million acres to 219 million acres between 1936-37 and 1945-46. This is largely because of the factors mentioned already, namely, the influence of the Grow-More-Food Campaign and of Irrigation Works. This becomes more evident when we consider the area under Non-Food Crops, which has varied from 46.7 million acres (1942-43) to 49.5 million acres (1940-41) in the last ten years. 1940-41 was the year when the War was at its height. Commercial Crops fetched very high prices, with the result that the area devoted to "Cash Crops" naturally increased. Since then the shortage of food supply has become progressively increasing, and considerable chunks of land have gone out of crops consisting in Industrial Raw Materials. From the point of view of planned economy, however, this kind of ad hoc adjustment or replacement of one type of crop for another can only result in prejudice to some sectors of the public economy, and, as such, affect adversely the entire Plan.

\*The Table inset shows the aggregate yield of the principal Crops —

\* In a Note on the **Technological Possibilities of Agricultural Developments in India**, Dr W. Burns has tried to estimate the effect of the Grow More-Food Campaign. From the data supplied to him

This Table shows a steady decline in the total yield of the food grains. The highest yield before the war was 54.7 million tons which, however, went on declining up to 1940-41. Since then, under pressure from the Grow-More-Food-Campaign and War-time rise in prices owing to armed Force's requirements, an increase in area under food-crops took place; and the total food grains rose to 60.5 millions in 1943-44. Thereafter there was a decline, which, in the latest year for which such statistics are available, shows the total yield of food grains at only 54 millions or some 10 per cent less than the yield in 1943-44.

As the Table given elsewhere shows, the yield is declining not only in the aggregate, but also in individual grains per unit of cultivation. This decline is the more serious because, side by side, a falling off in the total yield, there has been an increase in demand because of the in-

by the Education, Health and Lands Department of the Government of India in July 1943, he came to the conclusion that, in the 5 food grains of Rice, Wheat, Bajra, Jowar and Maize, there was an increase of 8.4 million acres under cultivation in 1942-43 as compared to 1941-42, and an increase of 3.856 million tons of yield

Of the increased acreage, 5.339 million acres were taken from cotton, and that was used to sow millets. From the figures before him, Dr. Burns also concluded that there was a net addition to the total area under cultivation

The factors responsible for such an increase in area as well as yield of foodgrains are listed by Dr. Burns as under:—(a) propaganda; (b) concessions and financial assistance, granted both by the Provincial and Central Governments, (c) legislative, or executive control over or restriction of area devoted to commercial crops like cotton or jute; (d) increase in prices of foodgrains; (e) favourable monsoon and similar factors affecting sowing and harvesting. No credit has been given to the seasonal factor.

Most or all of these factors can be utilised to give the desired turn to the crops needed,—whether foodgrains, or commercial crops, like cotton and jute. Dr. Burns concludes that, within fairly wide limits, acreage and production can be influenced, as they were in 1942-43, by deliberate measures to that end. A combination of persuasion, concession and compulsion may work wonders.

He has not stressed sufficiently the scientific aid in increasing crop-yield, or that of radically reorganising the entire system of agriculture, as recommended in another Volume in this Series. Nor has he quite considered the cost of the campaign intensively carried on in those days under pressure of war-time needs, to grow more food. In a planned economy we cannot ignore other aspects of the aggregate problem, even though relative urgencies, and consequent priorities, may count from time to time and affect the Plan in one or the other sector.

crease in numbers and also because of the improvement in their standard of living.

In the Union of India, the decline is even more serious than for the whole of undivided India before the 15th of August 1947. The Indian Union in 1945-46 shows the total yield of 39.290 as against the highest reached of 43.448 for the same area. This means that the bulk of the decline has taken place in the Indian Union where probably the population has increased more in proportion.

In the pages that follow the position of individual food grains crop is reviewed separately, and conditions of their farming have been examined in each case with a view to seeing where and what scope is available in the improvement of unit as well as the aggregate yield. Here in the general survey it is necessary to note that the decline is equally serious in Oilseeds which have been given separately in the foregoing Table. Some of these have their food value also, specially those which are utilised for production of vegetable ghee; and so to provide an additional percentage of fat in our aggregate food material which is otherwise lacking to make a more substantial diet.

Even sugarcane yield has declined from the peak of 5.8 million tons in 1940-41 to 5.4 million tons in 1945-46. The decline is once again more steady in the case of the Indian Union.

Of crops other than food stuffs more details will be given in a later chapter.

## CHAPTER IV

### Food Crops.

The position in regard to Food Crops proper that is the chief food grains is indicated in sub-joined table. The Partition of the country, added to other causes, mainly the steady growth of population, has intensified the deterioration, or increased India's dependence on foreign imports.

#### Total Area and Total Production of All Major Food Grains—Rice, Wheat, Barley, Gram, Jowar, Bajra, Maize in India.

	Area (million acres)			Production (million tons)				
1921-22	143.6			41.6				
1926-27	150.4			46.6				
1931-32	156.9			50.1				
1936-37	157.0			49.2				
1938-39	153.9			43.3				
1940-41	155.4			43.6				
1941-42	156.5			45.7				
	Indian Union	Pakistan	Hyderabad	Total	Indian Union	Pakistan	Hyderabad	Total
1942-43	150.0	38.0	14.0	202.0	42.2	12.1	2.6	56.9
1943-44	153.0	40.0	14.0	207.0	43.4	15.0	2.0	60.4
1944-55	169.0	43.0	14.0	226.0	43.4	14.3	2.0	59.7
1945-46	160.2	41.0	12.1	219.0	39.2	13.2	1.6	54.0

N. B. Figures for the years 1911-12 to 1941-42 are taken from the *Technological Possibilities of Agricultural Development in India*, by W. Burns, (1944).

Figures for the years 1942-43 to 1945-46 are taken from *Estimates of Area and Yield of Principal Crops in India 1936-46* Issued by the Economic and Statistical Adviser. April, 1948.

Statement showing estimated Production of Major Food Grains in the Indian Union during 1947-48 compared to the average Production for 5 years ending 1946-47. (Rice, Millets, Maize, Wheat, Gram and Barley).

(In thousand tons)

	Indian Provin- ces Produc- tion	p c of five Years' Average	Indian States Produc- tion	p c of five Years' Average	Hy'bad Produc- tion	p c. of five Years' Average	Total Pro- duction Indian Union Includ- ing Hy'bad State	p c of five Years' Average
Rice	17,312 (18,343)	95.5	1,085 (1,110)	98.8	410 (488)	87.2	18,807 (19,941)	95.5
Jowar	3,642 (3,184)	98.2	1,285 (1,126)	96.5	827 (898)	63.5	5,754 (5,208)	92.4
Bajra	1,516 (1,567)	81.4	1,195 (951)	93.7	67 (75)	44.0	2,778 (2,593)	84.4
Wheat	4,468 (3,858)	94.9	1,335 (817)	96.6	17 (5)	24.6	5,820 (4,680)	94.5
Gram	3,235 (2,932)	106.4	4 (5)	66.7	102 (105)	114.6	3,341 (3,042)	106.6
Barley	1,935 (2,123)	95.1	—	—	1 (1)	100.0	1,936 (2,124)	95.1
Maize	1,552 (1,503)	87.9	401 (417)	115.6	36 (20)	85.7	1,989 (1,940)	92.3
Total	33,660		5,305		1,460		40,425	

\* These States have supplied revised estimates since the issue of the first statement. The 1947-48 estimates for a few Rajputana States are not available. Therefore the 1946-47 figures of these States have been suitably adjusted in the light of the figures of reported States and have been utilised.

Note:—Figures in parentheses give the production in 1946-47.

The above Table is taken from the Final Report of the Foodgrains Policy Committee, 1948.

## **Rice.**

Considering the Crops in detail, we find Rice the most important crop in India, with the largest yield and the greatest area. It accounts for more than half the total food crops produced in India and occupies over 27 per cent. of the area under cultivation. In the Indian Union it covered nearly 60 million acres in 1943-44 and yielded 20.3 million tons of crop in the same year. Since then there has been a decline in area of over 5 per cent. and yield of over 10 per cent. But even so it continues to be the most considerable crop, covering the largest area.

Before the separation of Burma, the highest yield of rice was 33 million tons in 1931-32, the year of the deepest depression. Burma is a rich rice-producing country, and so a goodly proportion of rice consumed in India came from Burma as figures given elsewhere indicate. But even while that was part of British India, the total rice crop has varied from 33 million tons to as low as 23.2 million tons (1934-35) or a variation of some 30 per cent in round terms. Such a considerable difference may be explained by seasonal considerations as well as by a sharp decline in prices during the Depression, which made rice cultivation unprofitable, and led to the substitution of commercial crops on the same area previously devoted to rice.

It is noteworthy, however, that in the year of the lowest price level, namely 1931-32, the total yield was the highest being 33 million tons. We may account for this by the queer paradox, affecting all agrarian economy, that, in a regime of free enterprise, the more an agriculturist produces, the more he helps to depress the market against himself. As prices of his produce fall, he would have progressively to increase his output to be able to obtain the same money return if any of the items of the cost of production as well as other charges fixed in cash remain unchanged in terms of money. It is because of this that land goes out of cultivation from under Food Crops, and is devoted to what is believed to be more remunerative for the same investment of labour and capital. It is necessary to add that, in the Depression years, from 1929 to 1932, other agricultural produce was also affected in the same manner; so that the belief just noted is more of a delusion than can be imagined.



Since the separation of Burma, the average rice yield has been somewhere about 26 million tons. The lowest was in 1941-42, 22.2 million tons; while the highest seems to have been in 1943-44 being nearly 30½ million tons. This may be partly explained by the intensive effort in connection with the Grow-More-Food Campaign, and in response to the sharp increase in prices which followed the cessation of all imports from Burma, Malaya and other countries due to the War, and the Bengal Famine. There has been a steady decline in yield, after the peak was reached at the rate of some 2 million tons per annum, which has intensified the shortage of food supplies. \*Elsewhere figures are given to show the balance made good by the imports of rice during and after the War

It seems clear from a review of these figures that the Union of India is and will not be self-sufficient in the matter of the most important food grains in the dietary of the people, unless the per unit production is substantially increased by new land brought under cultivation, or existing land supplied with proper irrigation facilities and better manure. Says the Interim Report of the Food Grains Policy Committee (1948):—

“In our opinion it is clearly impossible, even if the requisite supplies were available in the world, to go on buying them at anything like the prevailing prices in the quantities which, according to the present policy, are deemed to be necessary. We have discussed the position regarding foreign exchange with the representative of the Ministry of Finance. We do not consider it necessary to dilate at length on the details of the foreign exchange position. The main difficulties involved are sufficiently clear. It is essential that this country should not get into a position in which it cannot pay for its imports with its exports. It is further essential that the foreign exchange resources of the country should be available for use in a balanced manner for securing imports of several categories of commodities essential for the development of the country, and not frittered away on the payment of excessive prices for unduly large quantities of imported foodgrains. Again, it is essential that expenditure on the subsidised distribution of foodgrains—which, in effect,

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\*See Table on Imports on page 47

is subsidy paid to foreign countries—should be drastically reduced and put an end to as early as possible.

For these reasons we conclude that there must be an entirely new approach to the food problem of this country. This approach should be based on two main objectives. Firstly, the dependence of the country on imports from abroad should be liquidated by orderly and planned stages. Secondly, The commitments undertaken by the Governments of the country under the present system of food controls—involving as they do an undesirable degree of dependence of the people on administrative agencies of Governments—should be liquidated by similar orderly and planned stages.”

While reviewing the area figures, note was taken of the potential increase in the aggregate area available for sowing, and an estimate was put forward of increasing the land surface available for cultivation by 50-75 million acres. In another Table are given figures of the average yield of the principal crops which point to a steady decline that would have to be arrested if the goal of national self-sufficiency in the matter of the country's food supply is to be obtained.

Reference has been made in other volumes in this Series regarding the possibility of obtaining alternative, or additional, food supply from our own resources. The enormous fishing possibilities in the coastal as well as inland waters of the country; as also in the animal wealth of the country and its possibility of yielding meat will have to be fully developed. In another part of this volume, mention will be made of providing a “balanced diet” which might also reduce the people's heavy dependence on food grains only. The demand upon land for raising fodder crops, or industrial raw materials, can also not be exaggerated or overlooked. But when every allowance has been made for all these considerations and requirements, the demand for foodgrains will continue to necessitate the largest single use of agricultural land in India. Everything therefore, that can be done to promote improving the extent and quality, or yielding capacity, of this land will have to be attempted, to enable the country's planned economy, to attain the goal of National Self-sufficiency in these elementary requirements of an independent country.

On the Supply Side the following figures may be interesting:—

**Export of Rice from Burma to British India.**

(Figures in tons).

	1938-39	1939-40	1940-41	1941-42	1942-43
Rice in husk (Paddy)	59,063	42,442	12,098	3,603	103
Rice converted into rice	44,298	32,582	9,074	2,703	78
Rice not in husk	1,280,910	1,766,761	1,173,184	981,874	17,923

This shows that out of a total import from Burma averaging, before the War, at something over 1,300,000 tons of rice, during the War, and particularly after Burma had been captured by Japan, the imports declined to vanishing point, leaving a very big gap between India's own production and consumption of rice. Imports in the years since the War has ended, have been very considerable. But the price paid for it is also very considerable, affecting seriously our Foreign Exchange position.

The Interim Report of the Foodgrains Policy Committee, (page 39), in the Minute of Dissent signed by Messrs. Gopalswami, Bakhle and Gupta, the following Table is given of the Imports and the Cost of these imports:—

Period	Quantity of imported food grain.  (Lakhs of Tons)	Total Cost.  (In Crores)	Cost of subsidy met by the Govt. of India (exclusive of subsidy met by States.)  (In Crores)
April 1945 to March 1946	9.31	26.00	Nil.
April 1946 to March 1947	26.58	88.70	20.59
April 1947 to Dec. 1947 (estimated)	19.12	77.97	17.35

As remarked by the Food Grains Policy Committee, we cannot go on depending always upon such heavy imports merely to keep the wolf from the door.

The other factors on the Supply Side were of a temporary effect. It may, however, be pointed out that the actual production of rice and possibly all other crops has fallen in yield.

### Rice Yield in India.

Year	Area All-India		Area British India only		Production British India only	
	million acres.		million acres.		million tons.	
1921-22	72.1		68.6		27.8	
1926-27	69.4		65.9		24.1	
1931-32	72.7		68.6		27.8	
1936-37	73.0		69.0		26.8	
1937-38	73.5		69.5		25.8	
1938-39	..		69.9		22.9	
1939-40	..		70.1		24.6	
1940-41	..		68.8		21.0	
1941-42	..		69.6		24.3	

  

	Indian Union.	Paki-stan.	Hyde-rabad	Total	Indian Union.	Paki-stan.	Hyde-rabad.	Total
**1942-43	54.5	19.5	1.1	75.1	18.3	6.0	0.4	24.7
1943-44	57.4	22.3	1.4	81.1	20.3	9.8	0.4	30.5
1944-45	58.9	23.7	1.2	83.8	19.1	8.5	0.4	28.0
1945-46	56.6	22.6	1.4	80.6	17.9	8.2	0.4	26.5

According to the Final Report of the Food Grains Policy Committee (1948), the average yield per acre for India as a whole (that is to say before the Partition) was:—

In 1936-37	862 lbs. per acre.	In 1942-43	742 lbs. per acre.
1938-39	731 do.	1943-44	847 do.
1939-40	776 do.	1944-45	752 do.
1940-41	679 do.	1945-46	736 do.
1941-42	772 do.	1946-47	771 do.

\*Figures for the years 1921-22 to 1941-42 are taken from "Technological Possibilities of Agricultural Development in India." By W. Burns, 1944.

\*\*Figures for the years 1942-43 to 1945-46 are taken from Estimates of Areas and Yield of Principal Crops in India, 1936-46. Issued by the Economic and Statistical Adviser, April, 1948.

The production per unit of India has declined substantially, that is by over 10 per cent, and that cannot be explained by merely saying that large areas of agricultural land have been withdrawn from this crop and devoted to commercial crops or temporary dislocation like the cyclone. The lowest per unit production was in fact in 1940-41, which was nearly 25 per cent below the level of 1936-37. Though there has been an improvement subsequently, reaching almost the 1936 level, since 1943-44, the tendency to decline is undoubted.

Comparatively speaking, also India's output of rice per unit is very poor in contrast with other leading rice producers, as the following Table shows :—

**Comparative Statement showing yield of Rice and Wheat in India as compared to other Countries.**  
(lbs. per acre.)

Area	1936.37	1938.39	1942.43	1943.44	1944.45	1945.46	1946.47
India (Before Partition)	862	731	742	847	752	736	771
China	1,655	N.A	1,462 *	1,424*	1,549*	N.A	1,549
Japan	2,454	2,392	N.A	N.A	N.A	2,030	N.A
Burma	918	1,005	806	624	669	624	N.A
Indo-China	699	743	N.A	N.A	N.A	N.A	N.A
Siam	949	906	837	906	806	756	N.A
Java & Madura	—	—	—	—	—	—	—
Irrigated	1,005	1,012	N.A	N.A	N.A	N.A	N.A
Non-Irrigated	531	594	N.A	N.A	N.A	N.A	N.A
Philippines	725	N.A	N.A	N.A	750	594	687
United States	1,485	1,427	1,299	1,294	1,357	1,363	1,334
Italy	2,940	3,190	2,848	2,447	N.A	2,285	2,431
Spain	N.A	N.A	2,938	2,517	2,859	2,511	2,358
Egypt	2,030	2,100	1,908	1,455	1,792	1,879	2,024

\* Free China only. N.A Not available.

Source: "The Rice Economy of Asia published by Food and Agriculture Organisation of the United Nations".

Note:—Data are from publications of the FAO (Rome Bureau) and the former International Institute of Agriculture, except for 1946-47 which are estimates of the U.S. Department of Agriculture.

Within her own Provinces, too, there are material differences in yield per unit. If the yield per unit is raised by only 25 per cent. of the best yield obtained in recent years by anyone or more of the several devices mentioned elsewhere the present day deficit in this most important article of our diet can be made up from our own resources.

On the other hand, the demand has intensified not only because the average ration per head will have to be increased, but also because of the increase in the total population all over the country. With an aggregate area in the Union of India  $5\frac{1}{8}$ ths of what it was in 1935-36, we have to feed a population 10 per cent greater than what was for India and Burma in 1931. With a reduced yield,—the average as well as the aggregate,—the increased demand has to be met. This can only be done either by wholesale imports as has been done in the last two years or by reduction of the domestic consumption per unit of ration. For Imports we have to pay immediately, while by reducing the ration, we will increase the debility and general weakness of our people's nutrition which cannot but react unfavourably on their productive capacity.

This problem will have to be considered from another angle later on. Here it is enough to repeat that the total productivity seems to be declining so far as food crops are concerned, and at the same time the demand level is rising. The Report of Sir John Russel noted in 1936-37 the tendency even then asserting itself, namely that the area under cash crops was rising, while that under food crops proper was declining.\*

**Areas of land under different crops in British India. (Thousand Acres.)**

	1915-16	1920-21	1925-26	1930-31
	1919-20	1924-25	1929-30	1934-35
Net area sown	220,691	221,971	226,410	229,051
Irrigated area	47,391	46,969	47,889	49,870
Area under:—				
Rice	79,331	78,981	79,167	80,367
Wheat	23,604	23,264	24,477	25,677

Jowar	21,817	22,669	21,352	21,826
Bajra	13,611	13,494	13,275	13,577
Gram	13,314	14,457	13,609	14,756
Sugar	2,797	2,757	2,830	3,233
All food crops including sugar (b)	210,614	209,494	208,658	214,746
Cotton	14,087	14,433	16,265	14,159
Total—non-food crops	42,587	43,775	49,362	47,551

Source—Table V in Sir John's Report P.15.

In the Cash Crops are included cotton, sugar, jute, some oil seeds, and wheat, while that under Food Crops are included rice, millets of all kinds, pulses and vegetables. Sugar, of course, has the capacity of both serving as food stuff and as a commercial crop. Even making allowance for that, while the net area sown had increased by 8½ million acres, the increase in Food Crops was only 4.13 million, and that under Non-Food Crops by 4.96 million acres. We shall consider in another section ways and means of improving or guarding against the several handicaps or defects noticeable in the science and technique, tools and accessories of cultivation in India, and consequently in the yield of crops for food and industrial raw materials. Here it is necessary to point out that the aid of science in improving the seed, by careful plant breeding, and adequate manure supplemented by artificial fertilisers improving the yield per acre has recently been receiving attention. Special institutions have been established to carry out research e.g. the Cotton Laboratory at Matunga, (Bombay), Sugar Technology at Cawnpore and the Fertilisers Factory at Sindri. The quantity of food produced in this country is expected to rise very substantially. Researches in the development of a suitable seed in the case of each of the important food grains are also being encouraged. If these are all mutually coordinated, we may look forward to an early and easy attainment of national self-sufficiency in this most vital requirement of our existence as an independent Sovereign State.

### Science in Aid of Rice Cultivation.

So far as modern science can be utilised for improving the yield, Rice is one of the most difficult crops to deal with. Being widely distributed, found practically in every Province and State in the Union of India, it occurs in a large number of varieties, each differing from the others and presenting its own problem. Considerable work has been done for developing special varieties, which would make a heavier crop or greater yield, at several stations like Coimbatore, Nagina, Chinsura, Bankura, Habibgunj, Sabour, Raipur etc. New strains or varieties are selected to suit the widely varying conditions of soil and climate. As, however, rice is grown in the hot season, and while growing the area is deeply watered, the labour involved is very arduous. All kinds of tests on variations are particularly difficult. A coordinated national scheme of rice research, as the Indian Council of Agricultural Research has been organising, has not yielded so far any particularly noticeable results, as is the case with cotton or sugar for instance.

In the several ingredients making for better yield, the most important is adequate and suitable manure. Manuring is not uniformly satisfactory. Special experiments have to be carried out to find out how the different varieties of Rice react to different forms of manuring. According to Sir John Russel reporting ten years ago to the then Imperial Council of Agricultural Research;

“Few of the experiments give really useful information about the effect of fertilisers on the growth of rice. Yet there is great need for experiments, for by common consent an increase in yield is very desirable. The rice crop is peculiar among grain crops in its requirements and conditions of good growth. A uniform but simple scheme carried out at the various stations would give valuable information; it should include nitrogenous and phosphatic fertilisers alone and in combination, with and without green manure”.

Next to manure, water requirements also must claim scientific attention if an increase in the quantity and an improvement in the quality of the several varieties of paddy, under different environmental conditions is desired. As in the case of sugar, combined experiments testing the effect of different watering and manuring on two or three selected varieties should be tried. The steady fall in the



yield per unit, noticed above, will otherwise be impossible to check or counterbalance, and the national deficiency in an essential of life will be intensified.

The diseases of the rice plant also make a considerable group of problems which must be simultaneously attended to. At several centres work was undertaken on "quality" of rice. The meaning of the term "quality" varies according to as it is considered with reference to its marketability, or its nutritive quality. So far as market is concerned, the local market is large and expanding. Any variety will suit and sell. From the point of view of export, at the present time we are so short of supplies for our own needs that this aspect may be neglected.

Improvement in the nutritive properties, however, would need special consideration; and as such Sir John Russel recommended chemical characteristics or properties affecting quality of rice be examined by nutritive experts. The difference in nutritive value between milled and polished rice which is deprecated by nutritive experts must also be borne in mind.

The area under rice crop is, as already remarked, the largest under any single crop. Not much of this is possible to convert into area used for any other crop. Few alternatives are possible to Rice particularly on the lighter rice soils. Alternative crops can be grown, e.g. ground nut, sunn hemp, arhar, jowar, bajra and maize; but that will be of a very slight extent. On the heavier soils there are no alternatives to Rice. As the yield per unit has been declining in recent years, it is important that all these aspects of the problem be considered and correlated, so that the aggregate rice supply of the land as well as its quality be improved.

Rice has been considered in the preceding observations from the point of view exclusively of a food material. It is possible to consider it also as raw material for industry. Starch can be produced from it; and just as wheat is important as raw material for making breakfast foods, so rice also can be made the basis of appropriate large-scale industry which will use it as raw material. So long, however, as the food shortage in the country is so severe, and rice remains the principal article of diet for the large majority of our population, industries founded on rice as raw material would naturally receive less attention in the over-all plan.

## Wheat

Wheat is the next important food grain crop in India, covering over 26 million acres in "British India" before the Partition and another 6 million in the Indian States, yielding some 8 and 2 million tons, respectively in round terms. The highest area under Wheat was in 1944-45 when it aggregated 35.98 million acres yielding some 10.55 million tons of grain. The highest yield was in 1942-43, being 11.032 million tons from 34.41 million acres.

Wheat is a winter crop largely situated in the North, the Punjab and the United Provinces; which, between them, account for nearly two-thirds of the total wheat area of the country. More than half of this crop is from irrigated land, where the yield per unit of cultivation is much greater than on non-irrigated land. It requires comparatively very little water. While rice requires 7 or 8 feet of water, and cotton,—the most important commercial crop—needs 2½ feet, wheat takes only 1½ foot, according to the statistics published by the Punjab Government regarding Irrigation Water Distribution, in 1934, and quoted by Sir J. Russel in his Report. Following the same authority the average yield on irrigated land was some 967 lbs. per acre, and on dry land 572 lbs. per acre. The average is between wide variations even on the same type of land. The yield per unit differs from Province to Province as shown below:—

### Average yield in lbs. per acre of Wheat.

Punjab	738
U. P.	786
C. P.	444
Bihar	882
Bombay	447
Sind	593
Hyderabad	231
Gwalior	458
Central India	382

The Table following gives the acreage and yield of wheat in India.

**Acreage and Production of Wheat in India.**

Year	Area British India only				Production British India only			
	(Million acres)				(Million tons)			
1911-12	25.0				8.5			
1916-17	25.1				8.4			
1921-22	22.4				8.4			
1926-27	24.2				7.4			
1931-32	25.3				7.3			
1936-37	25.2				7.9			
1937-38	26.6				8.7			
1938-39	26.8				8.0			
1939-40	26.1				8.9			
1940-41	26.4				8.1			
1941-42	26.1				8.2			
	*Indian Union	Pakistan	Hyderabad	Total	*Indian Union	Pakistan	Hyderabad	Total
1942-43	22.7	10.6	0.9	34.2	6.8	4.0	0.1	10.9
1943-44	23.0	10.2	0.6	33.8	6.2	3.4	0.07	9.67
1944-45	24.8	10.5	0.6	35.9	6.7	3.6	0.07	10.37
1945-46	24.0	10.4	0.4	34.8	5.8	3.1	0.05	8.95

It shows considerable variation both in the acreage sown and in the yield. This is due to a variety of factors like the character of the season, including rainfall, hot winds etc., the presence of rust, the level of prices etc. into the details of which we need not go.

\* These figures do not include the figures relating to Indian States, in the Union of India or Pakistan; and hence the seeming discrepancy with the totals given above. The figures for the last 4 years are taken from the Estimates of Area and Yield of the Principal Crops in India 1936-46, issued by the Economic and Statistical Adviser, 1948. Figures for the earlier years are taken from Technological Possibilities of Agricultural Development in India, by W. Burns, 1944.

Wheat, before the War, was one of the principal articles of export from India. The price obtained was, therefore, an important factor in regulating the area sown and the quantity of the crop raised. The principal export market was Britain, whose taste had therefore to be particularly studied and catered for, if decent return was to be had by the cultivator. Those who had made special experiments for raising the particular quality which would have the best demand in Britain had also attended to this aspect. The Punjab wheat was found to be particularly suited to meet this demand which was consequently largely exported. A certain amount of local consumption was always there. But, given the higher price of wheat, and the poverty of the Indian masses it was more commonly reserved for export. Its calorific value is also higher.

Since the War, however, exports of Wheat from India seem to have ceased; and this country has become among the leading wheat importers of the world. The increased wages must account for the larger home consumption. The fall in the Wheat harvest in India, as it remains after Partition, is accounted for by the withdrawal of the rich Punjab Canal lands where wheat was grown in such abundance. Sind wheat is also coming in the market; but that, too, is now Pakistan territory, which becomes a great wheat exporter. The Union of India, with its aggregate production of some 7 million tons as shown in the Table attached, is unlikely to be self-sufficient in this regard.

Nevertheless, with the prospect of new land being brought under the plough from the present day fallow or culturable waste, because of the several multi-purpose river training projects, which are calculated to reclaim and irrigate vast areas of land running into millions of acres we need not despair of attaining our principal objective of planned national economy, i.e. National Self-Sufficiency in regard to wheat. Statistics already given above, of average yield show wide variations in yield in the several Provinces of India. The Table below exhibits a still larger variety of yield per acre in the leading wheat growing countries of the world.

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* Countries of the World	Approximate yield of wheat per acre in lbs. for 1924-33.
United States	846
Canada	972
Australia	714
Argentina	780
Europe	1,140
Russia	636
India	636

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Considerable progress has been made in the last generation in applying science to Agriculture. The result is that countries, which, like Canada, would, by their climatic conditions, be presumed to be unsuitable for wheat-

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\* According to the latest (May, 1948) figures given by the Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, Commodity Series No 3. India, though not the lowest of the wheat producers of the world, seems to show a declining yield and the consequent necessity of imports from abroad. Taking the figures for 1946, India shows the yield of 9.6 bushels per acre which has declined to 8.7 bushels per acre in 1947, preliminary estimates. The highest unit yield in the countries reporting was in Czechoslovakia, which gave as much as 26 bushels per acre, France coming second with 23 bushels per acre. The largest wheat producer on an average between 1935-39 was the U.S.S.R. But that honour goes in 1947-48 to the United States, which has raised its production from 758.6 million bushels on an average to 1406.77 million bushels in 1947-48. The greatest producers in volume have, however, not the highest yield per unit. The U.S.A. has raised its unit yield from 13.2 bushels per acre on an average between 1935-39 to 19.0 bushels per acre in 1947. (preliminary estimates, according to the same authority).

\*\* Cp. Dr. Burns Report on the Technological Possibilities of Agricultural Developments in India pp. 57.

"What makes the greatest difference to wheat yields is undoubtedly irrigation. Wheats dependent only on the rainfall have a much lower yield. For example, in the Punjab, *barani* wheat gives a yield of only 560 to 800 lbs. per acre, whereas irrigated wheat gives 960 to 1280 lbs. and may go much higher, e.g., in 1935, the B.C.G.A. of Khanewal got over 2000 lbs. per acre. In the Bombay Province, dry cultivation of durum wheat gives 400 to 600 lbs. per acre, whereas irrigated Pusa 4 wheat gave 1300 lbs. when grown in well manured ground in suitable rotation."

56 lbs. eq 1 bushel.

growing at all, have become the largest wheat producers and leading exporters. By careful experimentation suitable varieties of seed have been produced which would grow, in the short Canadian or Siberian summer of less than 100 days, with a unit yield perhaps the highest in the world outside Europe. Vast stretches of snow covered prairies of winter are converted into rich wheat fields in summer. We do not know the exact position in Soviet Russia to-day. But the progress of science applied to meet all the wants of man is probably the greatest in that country under the impetus of the successive Five-Year Plans. Thousands of square miles of Ukraine as well as the Volga Steppes, the Don plains and Siberia are added to the area under wheat. If only human society were more sanely organised, there need be no fear of starvation to a single soul.

In India the large variations, under actual conditions, from Province to Province; and comparatively low yield in the country at large, give good reason to believe that there is ample scope for improvement. With all the aid modern science can bring to the task of farming; and with proper reorganisation of the agrarian economy and social system, with more economic and indivisible units of cultivation, the average as well as the aggregate yield of wheat would rise substantially. With the additional contribution made by the new land to be reclaimed brought under the plough; as well as by the extension of Irrigation, by canal as well as by well and tank, the Union of India, too, can produce all the 12 or 15 million tons of wheat she would need for her own local consumption. In planned economy on the lines adopted in this Series, we would not care much whether there is an exportable surplus.

For the moment, however, the problem of policy in regard to wheat production in India cannot be overlooked, as much because of our own food shortage, as because of the conditions of world trade and exchange. India is to-day an importer on a large scale; and it has been observed that the best guarantee against a local shortage in any year is to export in our own years of plenty. But that position-surplus of production over local needs—is not likely to be reached for years to come. While, in the matter of Rice, India herself is among the largest rice producers of the world, who may conceivably aim at producing some surplus for export in the near future, in the case of wheat she is at considerable handicap for export. This

handicap will continue to grow in the years to come, even though in the past she has figured considerably in that role, too. If India now desires to compete in the world markets she must produce standard grades. For, the competition will be with wheat producers working with the most modern machinery and labour-saving devices; and farming hundreds or thousands of acres in single units operated by power-driven machinery. The only considerable market, which, before the War, India could enter, was Britain. But here, now, the cheaper and more abundant Canadian wheat threatens India with rigid exclusion. If, under conditions of more durable and undisturbed friendship, Russian wheat should also enter into competition, Indian wheat would have little hope to hold its own. Australia has, in recent years, become a formidable competitor whose competition is likely to be intensified a hundred-fold, if the present proposals for wholesale migration of millions of Britishers materialise. Argentina and Brazil are no less important as competitors in the British Market, and in Europe as a whole.

In this situation India would do well to concentrate on meeting her own increasing demand. In the Crop-Planning Conference of 1934-35, it was considered wise that India should not produce more than 9 or 9½ million tons, which could be easily consumed within her own frontiers, even as those frontiers now stand for the Union of India. If this view is adopted, all improvements in the variety grown and lands brought under the plough will have to be with special reference to local demand. We in India use wheat for grinding in hand mills, and making the flour into chapattis; and not producing white flour by roller mill suitable for baking bread favoured in the English market. Instead, therefore, of studying the milling and baking qualities of the wheat we produce, our scientists would have to concentrate on the behaviour of the grain in the chakki of the flour and while preparing chapattis.

It may be added that, wherever people have a choice of cereals, wheat has always been preferred, at least by the Western peoples; and there is no reason to think India would choose differently. It is true, Bajra has more fat and a higher calorific value; ragi contains more calcium. Nevertheless people who have a choice take wheat. Wheat is a Rabi crop, which consumes water that could well be de-

voted to more paying cash crops, like cotton. The Kharif Crops—monsoon crops of millets have also a greater per unit yield. Sir J. Russel points out that the yield of bajra, maize, cholam, jowar is, in the Punjab, 20 to 25 maunds per acre as against an average of 12 maunds of wheat for the Province as a whole. Export of wheat, even if possible or necessary, would have to be judged from a variety of considerations, not the least among which would be, not only the quantity raised and the quality but also the reaction of that export on our foreign trade in general. The Trade Treaties recently made by the Union Government of India leave some room for wheat export. At the moment, however, our greatest pre-occupation is import; and imports of wheat from Australia, U.S.A., Canada have occurred in unprecedented volume.

The problem of policy regarding wheat trade—particularly exports from India, is further complicated by the presence of certain pests and handicaps on the Indian wheat farmer. Rust in wheat reduces yield\*, and therefore, needs to be resisted at every cost. It is the main explanation of the decline in yield of wheat in recent years, and the consequent short supply, necessitating heavy imports for the home market.

There are 3 kinds of **rust**, operating differently in different provinces; and making it difficult to find a variety of seed which would resist all types equally effectively. Fortunately, all three types are not equally virulent in every area at the same time. By intensive research and experiment it is becoming possible to breed varieties of seed which are rust-resistant to the prevailing local type. Pusa 114 is fairly rust-resistant, and is widely used in Sind. Dr. Burns mentions Imperial Pusa (I.P. 120 and I.P. 165), which, according to experiments made at Nawabganj and Raya in the United Provinces, in 1935, proved highly rust resistant, and yielded 50 to 150 per cent more than the usual local variety.

Most of the Provinces have now developed seed of improved variety, which to a degree insures against rust. In Bombay similar rust resistant varieties have been evolved, which, under dry farming, yield 800 to 900 lbs. per acre,

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\* "Taken over the whole of India, the annual loss from rust is of the order of about 5 per cent., in a year, when there is no real rust epidemic; but, in particularly badly affected places, it may be upto a hundred per cent".—Dr. Burns, Op. Cit. Loc. Cit.



as against the 400 to 600 lbs. of the traditional variety of Punjab, an ancient home of wheat, and Central Provinces, have followed suit. Experiments are continued in United Provinces and Bihar on parallel lines. Though the pest is far from conquered, yet, considerable progress has been made in the fight against rust. It is, therefore, not unlikely that India could maintain a fairly steady output, if export was a primary goal.

Another similar handicap on Indian wheat-growers is **Smut**,—is a disease of the wheat plant. It can be effectively dealt with by roguing out affected plants, and applying to seeds before sowing, the hot-water treatment devised by Prof. Luthra of the Punjab Agricultural Department. This is also getting under control.

Besides adequate water supply, another need of wheat crop in India is adequate and suitable manure. Cow dung is found to be the best manure for this crop under unirrigated conditions. In irrigated wheat lands powdered cake, or ammonia sulphate, drilled in with the seed, yield effective results. Farm compost has been found suitable for replacing cattle dung. Manure and no manure make a very substantial difference in yield. In irrigated land green manuring also gives profitable return.

Suitable rotation of crops is another device to increase yield. Wheat, toria, cotton—this has been found a worth while series. Wheat after wheat does not make an equally effective rotation.

“The results of the long series of Rothamsted experiments on wheat begun in 1843 and continued to the present time show that, as the nitrogen supply increases so does the yield, the relation at first being approximately linear, then with higher nitrogen supply, the increments fall off (this is of course a well known phenomenon with all fertilizers). On unmanured land the yield fell from about 20 bushels to 10 bushels after about 20 years, but it shows no signs of going lower. All the plots lost organic matter except the one receiving farmyard manure annually. The chief practical difficulty about the frequent growth of wheat was the fight against weeds, against which rapid autumn cultivation such as could be effected by a tractor proved an effective means of weed control and has in recent years been adopted with good results.

The effect of one year's fallow in restoring the original productiveness for grain was marked, but the effect lasted for one year only. No ill effects such as the soil erosion visible in Western North America and other semi-arid countries have been found in England with a regular fallow-wheat rotation."

**"Hill Wheats—**Along many hundreds of miles of the lower hills in the United Provinces and the Punjab, wheat is grown on terraced fields. Collections have been made of such wheats and grown at the Wheat and Potato Breeding Station, Simla. It is now clear that the poor stand and poor yields of these wheats is not merely due to lack of manure but that they are intrinsically degenerate. When grown side by side with other wheats on the same type of soil in the experiment station, they remain stunted and poor-yielding, while the others are much stronger and high-yielding. Moreover, if these hill wheats are heavily manured, the straw is too weak to stand additional nitrogen and lodges badly. The hill wheats are also very susceptible to rust."

Summing up, it may well be said that the Wheat position in India is not desperate, notwithstanding the present acute shortage, and the consequent need to import on a large scale. The aggregate area under wheat can be substantially increased by developing widespread irrigation, whether by large-scale river canalisation, or by tanks and wells bringing water to every field. With more abundant and regular water supply, the yield per unit would also increase, so that the land actually under the plough can yield more than it has been doing in recent years. With the existing wheat lands yielding more per unit of cultivation; and with new land coming under the plough for wheat cultivation, the total production can be very materially increased, the development of seed varieties able to give heavier yield and suited to resist particular handicaps, like Rust or Smut, the average as also the aggregate yield may be considerably increased.

Finally, Proper manuring and suitable rotation of crops would work in the same direction. The present shortage of wheat in India can, therefore, be remedied within a few years.

Whether or not we should seek to develop an export market for our surplus wheat (will there ever be a real surplus?) is a question of high policy, which will be determined—not exclusively by technological or even economic considerations affecting wheat cultivation. The claims of co-ordinated planned economy will not be satisfied, simply by increasing our wheat supply. It will have to be adjusted not only with the area and production of other food crops, but also of industrial raw materials. The country's need for the latter under a planned economy and intensive industrialisation would be steadily growing; and unless that need is met from our own resources, we would have solved one problem only to be confronted by another. However that matter is ultimately decided, the local supply must increase; and its quality suitably graded. Organisational improvements, e.g. suitable marketing and storage arrangement, appropriate grading and transport, will go a long way to do away with the present deficit in wheat supply within the country. Its use in a larger measure by the people as a whole, and not only the richer classes may improve the standard of living, and add to the health and strength of the people. These would, likewise, claim no small proportion of the attention of the Planning Authority, planning for the whole country and all its needs, material as well as cultural. Finally, the importance of wheat as material for breakfast food, as well as for starch-making should also not be ignored. It will all form part of the task before the National Planning Authority to adjust all these rival and somewhat conflicting demands and to integrate them all in an overall National Plan.\*

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\* "New Delhi, July 6 The first wheat forecast of the Indian Union, for 1947-48 released today by the Directorate of Economics and Statistics, Ministry of Agriculture, estimates the area sown at 21,317 million acres compared to 24,086 million acres in 1946-47, being a decrease of 11.5 per cent. The forecast does not include the area under the crop in a few States in Central India, Gujarat and Karnatak. The area in respect of these States included in the first forecast of 1946-7 was 42,274 acres

The decline in acreage has occurred mainly in the Central Provinces and Berar, the Central India States, East Punjab and the Punjab States; and has been attributed mainly to lack of adequate moisture at the time of sowing, shortage of seed and bullocks, increase in area under the Kharif crops, and communal disturbances in certain parts of the country."—(The Times of India of the 7th July, 1948).

**Barley.**

This grain occupied, in what was British India before August 15, 1947, less than 7 million acres, and yielded about 2½ million tons of crop. Almost the whole of this crop is grown in North India, the United Provinces leading with some two-thirds of the total area (4.1 million acres) under Barley, Bihar coming next with about 25 per cent., and the balance in the Punjab. The Table below gives the area and yield of Barley in the last 25 years.

**Acreage and Production of Barley in India\***

Year	Area British India				Production British India only.			
	(million acres)				(million tons)			
1921-22	7.4				3.2			
1926-27	6.4				2.6			
1931-32	6.5				2.4			
1936-37	6.5				2.3			
1937-38	6.3				2.1			
1938-39	6.2				1.9			
1939-40	6.1				2.0			
1940-41	6.3				2.3			
1941-42	6.5				2.0			
	Indian Union	Pakistan	Hyderabad	Total	Indian Union	Pakistan	Hyderabad	Total
1942-43	6.1	0.6	.07	6.707	2.0	0.1	.001	2.101
1943-44	6.1	0.5	.01	6.61	1.8	0.1	.002	1.902
1944-45	5.9	0.6	.006	6.506	2.1	0.1	.001	2.101
1945-46	6.2	0.4	.007	6.607	1.9	0.1	.001	2.001

Source:—Compiled from the April, 1948 number of *Estimates of Area and Yield of Principal Crops in India, 1936-1946*, issued by the Economic & Statistical Adviser and from *Technological Possibilities of Agricultural Development in India* by W. Burns, 1944.

This crop is not so important as food grain, as it is as a cash crop. It is used for making malt. Good barley, therefore, commands a price far above that obtainable for other cereals, and, as such, its potential value with commercial possibilities for export cannot be ignored.

Indian barley has been exported for many years to Britain; but not at a particularly high price. Attention needs consequently to be devoted by technological experts to produce a more suitable variety, which would fetch a better price, and enjoy a more secure position in the world markets. Barleys are grown in 2 varieties, two-rowed and six-rowed. Some of the recent six-row barleys are said to compete favourably with Californian barley, which is the most considerable rival. Ever since the introduction of a policy of Prohibition in the United States of America, in 1921, the latter had a poor local or domestic market in its country of origin; and so it was thrown on British market for what it could fetch. In 1933-1934 the United States repealed the Prohibition Amendment, and the local market revived immediately. Much of the grain, which used previously to be exported, now finds beer-makers taking it up within the country.

The British market has thus become once more open to Indian goods, which are aided effectively by two new factors. One of these is the system of Imperial Preference, inaugurated in 1933 at Ottawa, giving a specially favourable treatment to goods of British Commonwealth origin in the English market. Preference being granted to the Indian barley as against the Californian product, exports from this country received a fillip which may well be maintained to the advantage of India's foreign trade, if more attention is devoted to the production of proper variety for this use.

The trade in the past was not very considerable, because the quantity in which barley is available in India was comparatively negligible. And there was an added handicap in the presence of the Khapra beetle, which spoiled the grain for malt making. A large-scale cleaning plant at the port of export is thus indicated, together with the appropriate certificate of quality which all produce coming under the new marketing system now required.

### Millets,—Jowar, Bajra, Ragi, Maize.

Next after Rice, these four grains are the most important food material for the masses of India. They occupy in the whole of India some 63 million acres i.e. less than that for Rice, but far more than any other crop, and yield over 8 million tons of grain. They are grown all over the country, but more commonly in the dry areas of Bombay, the Punjab, and Central Provinces, and the leading Indian States, like Hyderabad or Gwalior.

The millets are a **kharif** crop, sown just before the bursting of the South-West Monsoon. Little more water is needed for this grain than what the rain brings. But if well or canal water is available it adds to the volume and nutritive value of the yield. Though the mainstay of dry areas, the millets form a complementary crop to Rice, i.e. where the rice area is high, the millet area is low; and vice versa.

Hyderabad State has the largest area under Jowar, Bombay, coming second with a little less. It has, however, the largest area under Bajra. Madras and the Central Provinces are next in order with respect to the area under Jowar. Punjab, Madras, Hyderabad and the United Provinces have, in the order named, considerable areas of Bajra, while Mysore is the largest Ragi producer in India. The figures given in the table appended give a more up-to-date position regarding the area and production of these grains in India.

Since the establishment of a Millet section at Coimbatore, and at Indore, considerable work has been done for improving the millet strains all over the country. Experiments have been made at Nagpur, Lyallpur, as well as in Bombay and the Punjab, in connection with their dry farming schemes, with the result that some improved varieties are beginning to be available. They give high yield per unit cultivated, resist draught, pests and diseases more effectively, and are proof against the troublesome parasite of striga.

Because, however, of the importance of these grains in the everyday food of the masses, and particularly because of the importance the nutrition experts attach to millets, more research is needed. The campaign during the War and after for growing more food concentrated

# ACREAGE AND PRODUCTION OF JOWAR, BAJRA, MAIZE, RAGI.

Year	JOWAR				BAJRA				MAIZE				RAGI			
	Area British India only		Production British India only		Area British India only		Production British India only		Area British India only		Production British India only		Area British India only		Production British India only	
	Million Acres	Million Tons	Million Acres	Million Tons	Million Acres	Million Tons	Million Acres	Million Tons	Million Acres	Million Tons	Million Acres	Million Tons	Million Acres	Million Tons	Million Acres	Million Tons
1921-22	23.3	5.6	15.9	2.6	6.1	2.4	—	—	—	—	—	—	—	—	—	—
1926-27	20.4	4.2	13.8	2.5	5.4	1.9	—	—	—	—	—	—	—	—	—	—
1931-32	21.0	4.4	13.9	2.2	5.9	2.2	—	—	—	—	—	—	—	—	—	—
1936-37	23.5	4.6	11.5	1.9	5.7	1.8	—	—	—	—	—	—	—	—	—	—
1937-38	20.7	4.0	12.5	1.9	5.6	2.0	—	—	—	—	—	—	—	—	—	—
1938-39	20.8	4.1	12.8	1.8	5.7	1.8	—	—	—	—	—	—	—	—	—	—
1939-40	21.7	4.5	13.4	2.0	5.8	2.1	—	—	—	—	—	—	—	—	—	—
1940-41	21.2	4.6	14.1	2.3	5.7	2.1	—	—	—	—	—	—	—	—	—	—
1941-42	21.8	4.0	14.2	2.2	5.6	1.9	—	—	—	—	—	—	—	—	—	—
	Indi- an U- nion	Pak- is- stan	Hyd- era- bad	To- tal	Indi- an U- nion	Pak- is- stan	Hyd- era- bad	To- tal	Indi- an U- nion	Pak- is- stan	Hyd- era- bad	To- tal	Indi- an U- nion	Pak- is- stan	Hyd- era- bad	To- tal
42-43	25.0	1.1	9.6	35.7	4.7	0.2	1.7	6.6	17.9	2.6	1.6	22.1	3.1	0.6	0.2	3.9
43-44	25.8	0.9	9.2	35.9	5.3	0.2	1.2	6.7	16.9	2.3	1.8	21.0	3.0	0.4	0.1	3.5
44-45	31.3	1.3	9.1	41.7	5.4	0.2	1.2	6.4	22.3	2.6	1.8	26.7	3.0	0.5	0.1	3.6
45-46	31.1	1.0	7.5	38.6	4.6	0.2	0.8	5.6	21.7	2.3	1.2	25.2	2.5	0.5	0.09	3.09

These figures for Ragi for the years 1942-43 to 1945-46 are taken from "Estimates of Area and Yield of Principal Crops in India 1936-46, issued by the Economics and Statistical Adviser, April, 1948, Ministry of Agriculture, Government of India. Figures for this grain are not given in the **Technological Possibilities of Agricultural Development in India** by Dr. Burns.

Figures for 1921-22 to 1941-42 are taken from **Technological Possibilities of Agricultural Development in India** by Dr. Burns, 1944.





more on reducing the area under cash crops, and bringing that area under food crops, than on improving the seed varieties, and making up for the other handicaps on agricultural production in India. Under a planned economy however, industrial raw materials obtained from agriculture cannot be ignored or sacrificed, though the primary need for food will be recognised by all. A properly balanced economy for the country as a whole will not be achieved; a really improved standard of living will not be available; and the country's defence needs will not be adequately attended to, if an all round, intensive industrialisation is not carried out. To increase the food supply of the country, therefore, it would be false economy and shortsighted policy, if land under industrial raw materials is sacrificed to grow more food; and other scientific means to increase the yield of food grains are neglected.

As stated already, these grains do not require too high a volume of water. In fact they do not grow where rainfall is above 30 or 40 inches per annum. Under dry farming, if the rainfall is well distributed even though lower in quantity, Jowar would yield abundant crop, especially if helped by one watering in the early stages. It needs a fairly good soil; but, under pressure of food need, or with the help of an early plentiful monsoon, it can even be grown on relatively poorer soil. Where the rainfall is less certain, and soil poor, it is replaced by **bajra**, which is a harder grain and can flourish under less favourable conditions of soil and water supply.

A special Committee of the Indian Council of Agricultural Research on Pulses came to the conclusion some ten years ago, that further research work on Jowar is more fitly the responsibility of Provincial Governments than a legitimate demand for Central subsidy. In certain Provinces and States, accordingly, selections have been made from existing varieties to develop new strains. But so far no large scale nation-wide attempt has been made to spread improved varieties.

The Jowar stalk makes excellent fodder for cattle, though in some States, places like Gwalior, it is not cut to the ground, but allowed to stand till it rots after the grain-bearing ear is removed.

In his work on **Technological Possibilities**, already mentioned Dr. Burns lists four methods of improving the

**Jowar**,—crop including grain as well as straw, in this country, viz.:—

- (a) the use of dry farming methods for both Kharif and Rabi crops;
- (b) utilisation of finely powdered sulphur, or, alternatively, a solution of copper sulphate, to prevent grain smut;
- (c) use of more manure;
- (d) measures against the two main insect pests, the jowar borer and the jowar grasshopper.

The Bombay dry farming method has proved its value by producing larger crop, and better return to the cultivator. In a village in Poona, the average results in 7 years, under a rainfall of 28.7 inches, were :—

	Yield in lbs. per acre.	
	straw	grain
Dry Farming Method	2,543	1,260
Cultivators' Method	2,444	741

In Northern India Dry Farming has shown its success in the case of **Bajra**, which yielded, in grain and straw, almost double the yield under the traditional method.

Proper and adequate manure helps very substantially the yield of Jowar. Experiments have shown that with manure the crop of grain and Kadbi (straw) can increase almost 50 per cent. Manure adds to the cost of production; but it makes up for that increase by more than a substantial addition to the yield, and so to the return obtained by the cultivator. Suitable rotation of crop also helps in the same direction. Cotton and Jowar alternating on the same plot have been known in Bombay, to increase the yield of grain by 60 lbs., of Kadbi 150 lbs., and of cotton 15 lbs. the manure being applied only at Jowar sowing. Even more striking results have been obtained in Madras with farmyard manure coupled with jowar-kapas rotation.

Scientific aid and improved technique, however, are further needed by this crop to guard against wastage through bird depredations and vermin or pests. On the whole, Dr. Burns sums up the outlook as follows :—

“There is no doubt that Jowar will remain one of the main crops of India, outside the heavy rainfall areas. Its yield, both in fodder and in grain can be greatly increased by a combination of the following measures :—

(1) use of good varieties and the sifting out of small seeds; (2) rubbing the seed against powdered sulphur as a remedy against smut; (3) dry farming methods; (4) manuring; (5) a single irrigation, if water can be spared; (6) removal and burning of jowar stubble; (7) better protection against birds; (8) sweeping operations against grasshoppers; and (9) better threshing and winnowing procedures; and (10) the use of chaff cutters; (12) pressing and baling Kadbi against famine; (13) making of jowar silage from fresh fodder; and (14) utilisation of fodder jowar as a fodder crop on sewage farms.

The same authority records variation in grain yield from 100 lbs. per acre to over 700 lbs. under dry farming; and, with the aid of some irrigation, from 1200 to 1500 lbs. per acre. In other countries the corresponding yield runs to as much as 3,000 lbs. per acre. There is no reason why India should not come to the same level, if all the scientific aids and technical improvements, even now suggested and experimentally proved, are adopted. When grown as green fodder, acre-yield of 10,000 lbs. to 30,000 lbs. on well as well as canal water and of 50,000 lbs. on sewage can be expected. Without any increase in area, therefore, the yield of this most popular crop can be very materially increased; and the gulf in the food supply may be easily bridged.

### **Bajra**

Bajra, the next important millet, occupied some 25.2 million acres in undivided India in 1945-46, though it was as high as 27 million acres in the previous year. There has been considerable variation in the area under this crop. There was a sudden rise in 1944-45 of some 5.6 million acres in the Union of India, which slightly declined in the following year.

The yield also has varied similarly, from about 2.2 million tons on an average between 1919-20 and 1941-42 to 3.9 million tons in 1942-43—a record. There has been a slight but steady decline since that year, till the latest figure shows a little over 3 million tons. The figures are

for India without the States (except Hyderabad); but the rise in area as well as yield is the greatest in what is now the Union of India.

Bajra is also a dry area crop, which has been known to grow under an annual rainfall as low as 9 inches. Wide fluctuations in the area and yield of the grain,—though not so much as in the case of Jowar; are due mainly to fluctuations or irregularity of rainfall, as also to the substitution in certain years of other more paying crop like oil seeds.

Being a cross-breed, Bajra is a difficult plant to breed. Even within local strains, there are considerable differences in yield and quality. Experiments at new fertilisation of the variety imported from East Africa have not been a success. Technical experts think best results would be got from mass selection of suitable varieties, or growing a mixture of otherwise isolated types.

This grain suffers heavily in seasons of excessive rainfall, particularly at the time of sowing, and is open to bird depredations. Protective measures against the latter are needed as in the case of Jowar.

Like that grain, it is a Fodder crop, and has been known to yield as much as 10,000 lbs. per acre of straw though the bajra Kadbi is not quite as nourishing as jowar. It does not need much manuring, nor is it liable to the boring pest, which affects jowar. Scientific opinion is inclined to believe that the present average yield of 320 lbs. per acre can be raised to 400 lbs. and the total production can be somewhere near 3.5 million tons in the Union of India quite easily to serve as a good stand-by to the people of the areas where it has been naturalised for centuries.

## Gram and Pulses

Gram is the most important and most widespread of Indian pulse crops. In the undivided India before August 15th, 1947, it occupied some 13½ million acres, and yielded 3.5 million tons, on an average of 24 years between 1917-18 and 1941-42. According to the latest statistics, supplied by the Directorate of Economics and Statistics, Ministry of Agriculture, Government of India, (April, 1948), Gram occupied 14.1 million acres in the Indian Union including the States acceding thereto, 2.957 million acres in Pakistan including the States acceding thereto; and 1.087 million acres in Hyderabad, a total for the whole country of about 18 million acres. The yield in these acres was: 3.025 million tons in the Indian Union, 0.626 million tons in Pakistan, and 0.109 million tons in Hyderabad. The area seems to have increased slightly; but the yield not much better than a quarter of a century's average between 1917-18 and 1941-42. The average yield per acre seems to be slightly less than 9476 lbs. per acre, in the Pakistan Provinces than the Indian Union, with 8483 lbs. per acre. But the States acceding to the former showed a much higher unit yield than in the States acceding to India, and even than in the Union as a whole. The range of variation in the yield per unit is very considerable, 50 lbs. in Bombay Central Division to 500 lbs. in Gujarat, 1200 lbs. in the Punjab.

### Acreage and Production of Gram in India. Figures for other Pulses are not available.

Year.	Area British India only.	Production British India only.
	(million acres)	(million tons).
1921-22	14.9	4.3
1926-27	14.4	3.9
1931-32	15.7	3.7
1936-37	15.5	3.8
1937-38	13.7	3.2
1938-39	11.7	2.7
1939-40	11.7	3.1
1940-41	12.7	3.2
1941-42	12.7	3.0

	Indian Union	Pakistan	Hyderabad	Total	Indian Union	Pakistan	Hyderabad	Total
1942-43	12.5	2.5	0.6	15.6	3.4	0.5	.08	3.98
1943-44	2.4	2.4	0.5	15.3	2.7	0.5	.06	3.26
1944-45	13.2	2.8	0.7	16.7	3.1	0.6	.08	3.78
1945-46	14.0	2.9	1.0	17.9	3.0	0.6	.1	3.7

Source:—Figures for the years 1921-22 to 1941-42 are taken from "Technological Possibilities of Agricultural Development in India by Dr. W. Burns, 1944. Figures for 1942-43 to 1945-46 are taken from Estimates of Area and Yield of Principal Crops in India 1936-46, issued by the Economic & Statistical Adviser, April 1948. The acreage seems to have slightly increased according to this table; but the yield remains practically unchanged.

Gram grows in all kinds of soil, both as a single crop and mixed with others, like wheat, maize, bajra or jowar. Generally a Rabi crop, it acts as a good rotation; and benefits the crop following it in the same soil much more than is fully realised. Gram breeding so as to resist the usual handicaps of blight or wilt has been tried in many stations, and varieties discovered which fairly answer the requirement. No effective remedy has so far been found, also, against the caterpillar which bores into the pod and does considerable damage to the ultimate yield. The crop, again, has not so far been suitably or adequately manured, according to Dr. Burns (Technological Possibilities of Agricultural Development in India, 1944.) The same authority holds that, given suitable varieties, which would effectively resist wilt and blight and the insect pests affecting the plant, and with respectable yielding quality, the aggregate production of this crop in the Indian Union may go into 10 million tons, if the acreage under it is substantially raised from the present Indian Union figure of less than 15 million acres.

Gram, like other pulses, is a great source of protein, which is very important in a country like India where a large part of the population is vegetarian. India has a great variety of pulses,—gram, guar, urud, masur, mung, chola, tur, math, mattar, and the rest. They are important, not only as an essential part of the food-supply of the people, but also for cattle, in the shape of their seeds, their hulls and green parts. They are also an invaluable

ingredient in the system of rotation, help maintain the fertility of the soil, whether when grown singly, or in mixture.

The period of growth varies from 4-5 months to 8-9 according to the variety grown. In his report on the Technological Possibilities of Agricultural Development in India, Dr. Burns observes, a propos of this crop :—"The crop (**—tur or rahar**) is drought-resisting, partly on account of its deep-root system. It is a remarkable restorative rotation crop, since (1) it is not only one which causes deep soil aeration by its roots, (2) adds nitrogen by its root nodule bacteria, but also (3) naturally manures the soil with a heavy dressing of fallen leaves."

Notwithstanding all these advantages, Sir John Russel thought (1937) that not much attention was paid by the (then) Imperial Council of Agricultural Research to a proper study and research in these grains. Soon after his Report, a special Committee of the Council was appointed (1940), which considered the problem of co-ordinating research on the pulses of India, and developing in each case a seed variety, and bringing about other conditions of mixed cropping, manure &c. which would increase substantially the yield from this group of foodgrains produced in India. Schemes have been put forward by several Provinces and States, all aiming at the production of a suitable seed congenial to the different soils and conditions in the different units, resisting more effectively its pests and handicaps, and providing as good a manure or rotation as possible.

The Fodder value of Pulses cannot be ignored.

## Fruits and Vegetables.

Besides the cereals and pulses, just considered, a considerable part of the ordinary Indian diet is made up by Fruits and Vegetables. They provide the essential vitamins and minerals which are not to be found in the same degree in the cereals or other grains. No satisfactory statistics of the area under these crops, or their total or unit yield are available. Dr. Burns, however, speaks of a rough estimate giving about  $2\frac{1}{2}$  million acres under fruit trees, and less than  $\frac{3}{4}$  million acres under vegetables.\* Sir John Russel, however, in his Report already referred to, gives the following figures for the area under Fruits and Vegetables :—

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(in millions of acres)

1914-15 to 1918-19	..	..	..	5.70
1919-20 to 1923-24	..	..	..	5.42
1924-25 to 1928-29	..	..	..	5.06
1929-30 to 1933-34	..	..	..	5.00
1934-45	..	..	..	4.82

\* Cp. Op. Cit. p. 34.

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The tendency to a steady decline is unquestioned here also. These figures are for ten years earlier than those of Dr. Burns.

What is the yield from these, and how the acreage as well as production can be increased, remains yet to be carefully examined. Considering the importance and value of this food material in the normal Indian dietary, it is surprising that adequate study should not have been made on the scientific side, which is being developed rapidly in the country for improving the quality and yield of agricultural produce of all kinds.

The War brought a great new demand for fresh vegetables, which also revealed the extraordinary difficulty of meeting it. Vegetables are essentially a local crop, consumed entirely in the immediate neighbourhood of the market gardener. Transport is insufficient as vegetables have not been raised on a large scale to supply a distant

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\* Cp. Op. Cit. p. 20.



market of unknown dimensions. The business is scattered, small-scale, seasonal and unorganised, except perhaps in the neighbourhood of metropolitan cities offering substantial perennial and profitable market. Different varieties cater for different tastes, and so do not admit of large scale industrialisation or commercialisation of this branch of Agriculture. Suitable and sufficient seed is also lacking, —at least in quantity sufficient to meet a demand of the volume the last War brought. Storing and grading arrangements are rudimentary, and so demand improvement, before the production of these items can be more profitable to the grower and improvement in the normal food supply of the country. The Agricultural Marketing Adviser has prepared a report showing the scope for marketing vegetables in India, following a survey recently made of the demand, supply and utilisation of vegetables. Such a survey was long overdue; but the full report is not available to the writer at the moment.

It is unnecessary to go into the details or circumstances of particular vegetables, and their special requirements. The most important and universal pre-requisite of successful vegetable growing is plentiful water supply of good quality; and good soil, or rich manuring. All kinds and varieties are and have been grown in India for a long time. Beans and Peas have been raised for generations, as also tubers and root vegetables, like carrots, beets, raddishes, potatoes, turnips, sweet potatoes, parsnip, salsifi etc. Gourds and pumpkins are native to the soil, with innumerable local varieties, as well as the vegetables which are the fruits of the plant concerned, like bhindi, brinjal, mirchi, tomato, etc. Salad vegetables like lettuce, and leaf or stem vegetables, like cauliflower, onion, and garlic, kohl-kohl and spinach in a large variety are found in almost every part of the country. Flavouring and seasoning vegetables, like mint, have along with spices, given its peculiar character to the Indian culinary art. Spices and drugs or condiments may not be reckoned as part of food crops; but they are essentially products of agriculture and are necessary for maintaining the health and strength of the population.

Though inconsiderable ground is occupied by it, the potato deserves special attention as wholesome and satisfying food material that can be grown in many parts of India. but more particularly in the mountainous regions.

It can be easily handled by the cultivator, and gives them a fair return for their labour and capital investment. Intensive cultivation with rich manure is its condition of success, which, however, are not difficult to provide.

"Potato in all countries responds very markedly to manure" says Dr. Burns in his work on the Technological Possibilities, and he gives the following figures of yield per acre of manured and unmanured crop.

Province.	Manured yield (in lbs. per acre)	Unmanured. yield (in lbs. per acre)
Assam.	10,140	7,590
Bombay.	15,824	7,000
Madras.	20,000	8,275
United Provinces.	10,944	5,776

The same authority declares : "Cold storage of potato seed is definitely a success." Suitable and sufficient seed is also a desideratum which the latest efforts of those concerned are trying to make good.

For new varieties, there is scope, which, however, has not been explored and developed as well as might be expected, especially in these days of intense food shortage. Soya bean has possibilities, which have been officially recognised and amply demonstrated by the scientist as well as by the popular leader. But the ingrained conservatism of the principal mass consumer,—the Armed Forces of the country,—prevents the necessary encouragement being given to any large-scale experiment being made in this very promising field. Lala Sri Ram, a member of the Food Grains Committee, in a special Minute of Dissent to the Final Report of that body (March, 1948), argues energetically in favour of immediate and intensive attention being paid to the sweet potato, as likely to bring quick and increasing returns from its relatively greater yield per acre than cereals, and equal if not better food value. He considers it likely to fill the gap in our food resources within a very much shorter space than the other expedients suggested by the Committee as a whole. It remains to be seen when and how such matters would receive their due attention demanded by the intense and prolonged food shortage in

the country. Even potato, which has long been familiarised, and whose merit as an article of food has been proved by all peasant countries of Europe, is still in need of suitable and abundant seed, which has for many provinces to be imported from abroad, while its distribution is still in its infancy.

Dehydration of vegetables and their consequent preservation for a long time has been practised in India from time immemorial; while making preserves or pickles is an accomplishment of a competent housewife that has even today not lost all its charm. It is said dehydration makes vegetables lose some of their vitamin value; but even so the art needs to be fostered and developed far more intensively than has been the case so far. It is a small or cottage industry which may have potentiality on a large scale; but, even as it is, proper organisation may help its very considerable growth to the substantial benefit of the country.

### Fruits

Though the area under fruit cultivation is very small, a large variety of fruits has been grown in India from time immemorial. The preponderance of vegetarian diet by the vast masses of the people makes the use of fruits highly popular and that is now reinforced by the advice of nutrition experts. The indigenous varieties have been within the reach of the poorest classes until quite recent times. Their progressive impoverishment under a system of production for exchange, characteristic of the British regime in India, has made even this common article of food a luxury. Local production must have declined; or the demand of the richer elements must have increased; for there are considerable imports of foreign fruit competing with local varieties in the Indian market. The invention of Cold Storage has facilitated the entry of this kind of perishable commodity into international trade. Fruits are imported in considerable quantities from Australia, the United States and other countries, not the least important of which are those across the North West Frontiers of India. Dried fruits had been, indeed, an article of trade by caravans with Central Asian countries from the earliest times. At the present time, the Indian fruit market has become loaded with imported apples, pomegranates, grapes, dates, and oranges side by side with the local mango, liches, papaya, jack fruits, berries of all kinds, and bananas.

For the local product the most considerable production is in the hill tracts, at least of the acclimatised varieties. For the purely indigenous fruit, like mango, banana, papaya, pine and custard apple, guava, melons, chicoos, jambuls, almonds, cherries, dates, etc. all parts of the country seem to have facilities, though the specific variety grown is peculiar to each region, as in the case of the mango and the banana. Approaches to many towns and cities are marked with orchards; while the main national highways were always planted thickly with such trees. Here is an excellent means to add to the area under fruit cultivation, and so to the volume of food available in the country.

The most considerable problems in the more widespread use of fruits, as part of the normal diet are : transport, grading, and storing. In the urban markets quality is important, and that emphasises still further the problem of transport. This needs to be much more systematically organised than is the case today. The grading and storing, especially to guard against decay by refrigerators, is indispensable if we desire on economic or nutrition grounds to popularise the use of fruit in the daily diet of the people to the utmost possible degree. The extension of fruit cultivation, particularly on terraced hill slopes, or culturable land reclaimed and brought under the plough, is a possibility which demands immediate attention, as fruits constitute a substantial and welcome addition to the country's food supply. There are technological problems in regard to fruit culture, relating to soil, seed, manure and water supply, which are no less important than those in connection with other crops. We need not go into the details of these scientific or technical problems in this popular survey of our crop resources. Besides, they all concern the improvement of quality and increase in quantity of the fruit crop, which is common ground for all other crops.

An aspect, however, of fruit cultivation, which touches both increase in the food supply of the country as well as aid in its industrialisation, that seldom attracts adequate attention from the agricultural technologist, relates to the Canning Industry,—preserving fruit in all sorts of ways and forms, so as to add substantially and for all time to our total food supply. Fruit and vegetable preserving is an ancient art in this country. As noted elsewhere, trade in dry fruits was very considerable in ancient times, both

import and export from India. Every **mali** knows about it, as every housewife knows or used to know about vegetable preserves, pickles, jams, and de-hydration. But the mass production by means of power-driven machinery of fruit preserves of all kinds for an unknown market is a relatively modern industry, which shows possibilities in India that demand to be immediately and systematically attended to if the local market is not to be swamped by the imported product of America, Australia, or Europe.

Preserved fruit may not have the same taste, vitamin, or mineral value in the composition of our daily diet, as fresh fruits and vegetables have. But the latter are essentially a perishable commodity, which can only be available in their natural season, unless they are stored in forms suitable for preservation. If we depend only on the natural and seasonal supply, it is more than likely that, while during the season there may be super abundance making for waste as well as cheapness, outside the season it may mean a scarcity verging on total absence. That is avoidable and ought to be so guarded against. Canning on a factory scale of mass production of the indigenous fruits must, accordingly, form an integral part of the National Plan in this sector, so that not only the present threat to the nation's food supply may be remedied, but a permanent addition secured which would cost relatively nothing. At the same time, the planning aim of National Self-Sufficiency would be materially advanced in an important group of articles of food.

**\*Acreage of Fruits and Vegetables including Root Crops in India (In million acres)**

	Area All India	Area British India
1916-17	..	4.5
1921-22	4.4	4.0
1926-27	4.3	3.7
1931-32	4.5	3.8
1936-37	4.7	3.8
1937-38	4.6	3.8
1938-39	..	3.9
1939-40	..	4.0
1940-41	..	3.9

\*Source—Technological Possibilities of Agricultural Development in India, by W. Burns, 1944.

## Oilseeds.

Oilseeds used to be more of commercial than of food importance in our national economy; but in later years the situation has been changed almost radically. Something like 7 per cent of all area under crops in India is occupied by these seeds, in which Madras leads with more than  $\frac{1}{4}$  of the total. The following statistics give the latest figures about the area and yield in India as a whole, as well as in the Union of India.

### Acreage and Production of Total Oilseeds in India.

Years	Area (million acres)				Production (million tons)			
1927-28	11.6				4.2			
1931-32	10.0				4.3			
1936-37	15.5				5.5			
1937-38	16.9				5.0			
1938-39	16.1				5.2			
1939-40	16.2				5.2			
1940-41	16.7				5.7			
1941-42	14.5				4.5			
	Indian Union.	Paki-stan.	Hyde-rabad.	Total	Indian Union.	Paki-stan.	Hyde-rabad.	Total
1942-43	17.0	2.0	3.0	22.0	3.7	0.3	0.7	4.7
1943-44	18.0	2.0	5.0	25.0	4.2	0.2	1.2	5.6
1944-45	19.0	2.0	4.0	25.0	4.6	0.2	0.8	5.6
1945-46	19.0	1.0	4.0	24.0	4.1	0.2	0.8	5.1

According to this, the area under these crops has steadily increased, at least by 50 per cent. in India, markedly in what is now the Union of India; but not so much the total yield of these Oilseeds. Considering their food as well as industrial value, it seems surprising that the production per unit appears to have rather declined. Efforts are, accordingly, called for to increase the unit as well as the aggregate yield.

\* Source—Technological Possibilities of Agricultural Development in India, by W. Burns, 1944, and Estimates of Area & Yield of Principal Crops 1936-46 issued by the Economic and Statistical Adviser, April, 1948,

In the years before World War I, the bulk of these seeds used to be exported, and the oil or other products made out of them to be imported. India was a loser, at least as regards freight, both ways. After that War, and since the adoption of a policy of Fiscal Protection to Indian Industries, these commodities are almost all finding a local market as edible substances or industrial raw materials, and consumed entirely in India. Except linseed, which is still a considerable article of export, ground nuts, rape, mustard, sesamum, sunflower and niger are all used up locally. A small proportion of ground nuts is exported, but the bulk is used at home for making vegetable ghee. Rape cake, castor oil, and linseed cake also figure among exports. Cotton seed is used as cattle food, or seed for new crop, and the balance, if any, wasted. Oil seed cake, however, makes excellent cattle feed, which requires to be much more systematically and widely attended to than is the case even now. It may be added that castor and neem cakes are also used as manure. We need not go into the details of the area and yield of these crops individually, notwithstanding their importance in the food supply of the country.

### **Five-Year Target for Oilseeds.**

**Increase in Area Urged.** The Oilseeds and Soap Industries Panel appointed by the Government of India, has, in its report, recently published, recommended that the area under oilseeds be raised by 13,150,000 acres to 36,450,000 acres, so as to secure 2,193,000 tons of fixed oils and fats, and 3,450,000 tons of oilcakes in the next five years as a target for the whole of India. For partitioned India, this much acreage may not be available; but its demand also would be proportionately lower, and so an increase of acreage in the same proportion may serve the need of the Indian Dominion.

While the bullock-driven **ghannies** are capable of crushing 800,000 tons of seeds per annum, the Panel envisages an increase of 50 percent in power-driven rotaries in order to enable them to crush an equal quantity. At the same time, it holds the view that 1,800 new expellers, and an equal number to replace the existing obsolete plant, will have to be installed if their crushing capacity is to be raised from 2,400,000 tons to 4,500,000 tons. Thus, the total requirement will be spread over 4,800 expellers, 150 hydrau-

lic presses, and 18,000 rotaries in addition to ghannies. Such of this machinery, however, as will have to be imported may not be delivered within a reasonable period, quite apart from the difficulties of the necessary Foreign Exchange. The only alternative for reaching the target is to develop the more primitive means of pressing for oil in the indigenous oil-mill.

**Soap Output.** In regard to soap, the Panel fixes the target for the first five years at a minimum level of 300,000 tons, against the pre-partition out-put of 140,000 tons. The achievement of this target will mean absorption of 210,000 tons of oils, fats and resin. To reach the target for toilet, soap, it will be necessary to have about 20 new units each, with 300 ton annual capacity, 10 units with 600 ton capacity, and 2 units with 1,000 ton capacity, requiring Rs. 40 lakh worth of imported equipment. As for the household and laundry soap manufacture, the need is estimated at 25 units, each having 1,200 ton annual capacity, 9 units with 3,000 ton capacity and 7 units with 5,000 ton capacity.

While expressing the view that the development should be simultaneous, the Panel observes that "no cartel is necessary and, in fact, every attempt to form a cartel should not only be discouraged but put down."



### Fodder Crops

Though fodder crops may not be regarded, strictly speaking as part of food-crops needed for human consumption, we must nevertheless take note of that item in this survey as the nature and quality of the cattle wealth of the country depends on the excellence and abundance of that crop. In a Statement attached to his work on the **Technological Possibilities of Agricultural Development in India**, Dr. Burns gives the following interesting figures regarding the number of cattle, the acreage under cultivation, and that under special fodder crops; the quantity of fodder available, etc. and compares the same to the estimated requirements. According to that:—

The total Bovine adults numbered	106.8	million heads
„ „ Area under special fodder crops	10.5	„ acres
„ „ production of special fodder (dry)	19.53	„ tons
„ „ „ „ grasses „	67.74	„ „
„ „ „ „ straw (food- grains) (dry)	87.20	„ „
„ „ „ „ roughage „	174.47	„ „

This means a daily ration of 10 lbs. of dry roughage per head of cattle. The same authority estimated the need, for such nourishment at 15 lbs. per head per day. Comparing the aggregate requirement on this basis with the total fodder grown in the country, there seems to be an annual deficit of 49.762 million tons.

In regard to concentrates for cattle food, the total of available was some 3.729 million tons, as against an estimated total requirement of 12.795 million tons, on an average daily ration per head of a pound. "It will be seen" says Dr. Burns, "that the available supply of concentrates and of roughage are sufficient for only 29.14 per cent. and 78.53 per cent respectively of the existing cattle population".\*

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\*Cp. Op. Cit. p.111,

Dr. Burns makes, indeed, no allowance in his estimates for extra cattle food in the shape of grazing available in the forest areas. There are large tracts of this kind in almost every Province; but they are accessible and used only for a small proportion of the cattle in the country. The deficit, however, in the cattle food in the country is due, principally, to an overlarge number of animals. India has the largest cattle population in the world some 250 million heads—proportionate to the area sown. Cattle censuses used to be taken in the past every five years in India, and though the figures they revealed may not be fully reliable, all indications go to show that there was always an excessively large number. Among the most important and urgent tasks, therefore, of the National Planning Authority would be to bring about a reduction in this insupportable number, and improvement in the food resources for the remainder. The yield from our cattle, in the shape of milk, meat, wool, hair, hides, bones, etc. as well as haulage and other work expected of them, is comparatively very low; and it cannot be improved so long as the cattle are so badly fed. If the present excess is disposed of, the remainder and more productive or serviceable cattle would have much more and much better food.

The radical remedy of thinning out the cattle numbers is wholesale slaughter of the unfit, diseased, superfluous, or super annuated animals. But that would never be accepted by the mass of the Indian people, bred and nurtured in ideas and traditions of the sacredness of life. There are, however, other remedies, which have been more fully considered in the volume of **Animal Husbandry** in this Series; and though most of those remedies may take time to be effective they are not the less certain to yield the desired result.

The bulk of the cattle food is provided by the stalks of food grain, like wheat, bajri, jowar or maize, by jungle grass, and by dried straw. Concentrates in the shape of oil cakes, or specially grown fodder is rare, as the figures given above show. Only in four or five provinces, some area is placed specifically under fodder crops, e.g. Punjab with nearly 30 million acres (in 1936-37) under all crops yielding 4.8 million tons of fodder, or 16.1 per cent. of the total crops raised in the Province. Bombay with 34.1 million acres sown, yielding 2.6 million tons of fodder, which was 7.6 per cent of the total crops raised in that Province. The United and the Central Provinces, were very poor run-

ners up, according to Sir John Russel, from whom the above figures are taken.\* The total area under Fodder crops in British India, as it then was is given below from 1921 to 1942 :—

**\*\* Acreage of Fodder Crops in India (in million acres)**

Year	Area All India	Area British India
1921-22	11.6	8.4
1926-27	12.3	8.7
1931-32	12.2	9.4
1936-37	13.7	10.6
1937-38	12.8	10.4
1938-39	..	10.4
1939-40	..	10.5
1940-41	..	10.5
1941-42	..	..

As already remarked, these crops are not the only food the cattle in India have. Forest grazing is an important supplement, but is liable to be wastefully and uneconomically used. Grazing areas, on the other hand, in what is known as cultivable waste, is much more considerable in point of providing food for cattle. Only about 10 per cent. of the cattle in those Provinces which have considerable forest grazing area get access to such grazing grounds. The pasturage in Provinces where the forests are under State control, or leased to contractors on specific conditions, remain good and affords easy scope for improvement. Where, on the other hand, the Forest Department has no control, grazing possibilities become very scanty. It was, therefore, suggested by experts in the past, that if adequate

\*Cp. Op. Cit p-39.

\*\* No Statistics of the production of these crops are available nor any statistics of area or yield for the years after 1942-43. The Partition must have affected very seriously the fodder position in the Union of India. These figures are taken from Dr. Burns' work, as also other statistical material on this subject.

forest grazing was to be maintained, the period during which such grazing can be permitted must be restricted, at least for the monsoon months, so as to give green herbage a chance of developing. Besides excluding all animals from grazing in these areas during the four months of the monsoon, there must be a rigid restriction of the number of animals that can be allowed to graze in a unit of such area. Such restrictions can be imposed either by regulation or by levying fees, though the latter method is unlikely to prove popular. On an average 2 acres of forest land per head of cattle is regarded as sufficient for such grazing, though local conditions may cause variation of this standard area from place to place.

More than 90 per cent of the animals, however, have no access to such pasture; and the problem of feeding them suitably and adequately becomes of prime importance. The culturable waste land, of which there are large chunks in every Province, and which provides good non-forest grazing ground, can well be utilised for grass growing and timber plantation, which would provide both fuel and fodder. Sir John Russel quotes the instance of the Forest Department, United Provinces, who have planted, at little cost, thousands of acres in the Shahrānpur and Bahraich Districts, from which is expected an yield of 600 tons of green fodder and 1,500 tons of firewood per square mile of plantation every year.

Other good grazing ground is also available, but it is often in private hands. Its indiscriminate use would be ruinous to all interests concerned. A suggestion has, therefore, been made that such grounds be fenced off, and that grazing there be allowed in rotation.

There are thus great possibilities of improving available resources to increase the cattle food, and so add to the aggregate food supply for the human being in the country. In a carefully planned economy, these various matters will be mutually adjusted and coordinated, so that due space is provided for every requirement without any item impinging on another and causing lop-sided growth.

## CHAPTER V.

### **Handicaps of Indian Agriculture**

In more than one Volume in this Series frequent mention has been made of the number of handicaps which affect the Indian agriculturist in his task of raising adequate or abundant crops in the country. In the present volume we need not go into details of those handicaps, nor examine in fuller degree the remedies proposed in each case. Attention must, however, be drawn to the existence of the chief amongst these handicaps, obstructions, or impediments which make it impossible for the land in India to yield a fair or proportionate return to the cultivator for his labour and the capital invested therein.

#### **(i) Backward in Education.**

The most considerable of these handicaps affecting the cultivator personally is, of course, the appalling ignorance that prevails among the rural masses of the country. The minimum standard of education,—that is to say, the merest literacy in one's own language, cannot be claimed even today for more than 12 per cent of the total population, notwithstanding all the efforts made in recent years to step up the spread of education, and make it more abiding with the children or adults brought under its wing. The percentage of mere literacy may be greater among men,—say one in four—than women; but even after making allowance for that, the sheer mass of ignorance and all its breed of superstition, distrust, lack of initiative, seems appalling.

This ignorance does not affect so much the actual process or technique of cultivation. In his own traditional ways, the Indian peasant is a fair master of his craft who has not much to learn in the daily details of his occupation. But the illiteracy is indirectly prejudicial to him and his work, because of his inability to familiarise himself with the latest developments,—scientific or technological,—concerning his work; and so render him unable to improve the results of his labours which a literate peasant can easily achieve. Not only he remains unacquainted with the inventions or discoveries affecting agriculture; he becomes psychologically unable to appreciate the full significance of these changes or developments. He gets rooted

in traditional practice and conventional ideals much too much to be alert to these new currents.

Even if the limited knowledge of new developments and the extreme poverty and small size of his holding, which characterise the Indian Peasant, would not allow him to avail himself immediately of these developments, most of which are costly and impracticable on a small scale, he might nevertheless be able to overcome these intrinsic difficulties of the present organisation of agriculture in the country, if the rural economy is wholly reorganised on a more co-operative, if not collectivist, basis. For this, however, it is important that the new thought be conveyed or made familiar to him. The advantages of radical reorganisation, as explained in books, pamphlets or periodicals, must be accessible to as well as understood by him. But while he remains illiterate, it is not possible for these devices to bear fruit as might be expected.

The latest methods of furthering the knowing of scientific, technological as well as social, developments can counteract this handicap. The radio, the cinema, or talkies if more widely used in the country-side, would go a long way to make up for this handicap if only a planned campaign for spreading such information and publicity is undertaken. Those concerned with the development of agriculture in India are not unaware of the utility and possibilities of these devices and inventions for the end in view. But the lack of adequate equipment, and also the absence of exactly suitable literature or missionaries in this behalf, prevents the most vigorous steps of this kind being taken and the obstacle caused by mass illiteracy and ignorance being overcome.

### **(ii) Absence of Leadership**

This applies no less to the leaders of the rural community than to the average peasant cultivator or landless labourer. The hereditary landlord class, comparatively more prosperous, was long after its creation indifferent to the needs of his own source of livelihood. He was a perfect parasite who lived on the fruits of other people's labour. The very prosperity which he enjoyed induced habits of vice, wastefulness, as well as absenteeism to a large extent from the land itself, which prevented the so-called natural leaders of the rural community from exerting its influence towards steadily and progressively

improving the lot of the cultivator and the produce of the land. The argument pre-supposes that that class itself was better educated and able to understand the developments in science and technology. In fact, however, the zamindari class was scarcely better educated, at least in the sense that would fit it for real leadership, and direct initiative in improving the yield from land in quality as well as quantity. Now, however, the zamindari class is going to its inglorious doom; and its place is not yet taken, to the degree it is necessary that the place should be taken, either by the public servant representative of Government, or by the popular leader. Until quite recently the public servant was a representative of the foreign power ruling the land which was far more content to keep law and order, or, so to say, the peace of the grave, than to take a more active interest in the development of land and the progress of agriculture. Occasionally a fashionable fad with the man at the top in a Province or at the head of the country's governing machine, who had signalled himself for a particular activity, like co-operation or education, or health, was copied almost immediately by the local representatives of the "Mabap" Government. Co-operative Societies were started, schools built, special dispensaries and hospitals founded, not according to the needs of the people in that behalf but according as the wind of official favour blew. But these hardly ever touched the fringe of the problem because the spirit that moves was lacking. The public servant, as represented by the Collector and his staff of Assistants and coadjutors, was usually himself a bird of passage in a given post in a given locality, stationed in a place for three years or less and shifting from department to department, ostensibly to give this highest branch of the service experience of all parts of the country in all departments of Government; but in reality this system prevented the top ranks of officialdom from taking any deep and sustained interest in the welfare of the people, or the success and development of their principal industry.

The public servant of the new type, the indigenous brand with a measure of patriotic faith and fervour, has yet to develop traditions of real service to the people, and understand the responsibility as well as the possibilities which lie before the country. Those of this class, however, who are today in the top posts are seasoned in the system which is being replaced and imbued with an outlook,

accustomed to methods and wedded to ideas which are not always in the interests of this country or its people. They are impossible to replace all at once; and the new popular and responsible ministers must needs lean on them for such technical knowledge and administrative experience as are indispensable for the task of Government. Until the new recruits, trained in more congenial surroundings, arrive at a stage where they may have some scope for direct initiative or at least suggestion, hope of leadership and initiative from this direction must be very slight indeed.

On the other hand, the popular leader is equally unable to supply that knowledge, experience as well as initiative which are indispensable to bring about an improvement in the daily life of the people and their chief, if not the sole, source of livelihood. Where democracy under a system of Parliamentary responsibility is oldstanding, such leaders can provide new ideas as well as drive to achieve progress. But India has yet to build up her like traditions. Great interest was no doubt aroused in the daily life of the villager by the work and teachings of the greatest National Leader, Mahatma Gandhi. But it may be questioned whether all his followers, right down to the villager, who professed his philosophy of life and repeated his maxims, fully appreciated the significance of those teachings, or cared to implement them to the best of their opportunity.

Politicians in all democratic regimes are more concerned with publicity than with constructive activity affecting the details of every day life. Party Programmes are formed by them containing high sounding nostrums, which happen to be the slogans of the moment or pet themes of one or the other leader without, however, any serious attention to eventually implementing it. Until last year the Indian Politician had, more-over, no sense of direct responsibility that comes to leaders in those countries where there is a periodical rhythmic swing of the parties' pendulum, and consequent inter-change of the party in power, so that what is claimed to be the Party Platform in Opposition may have to be implemented following the next general election much more seriously than would be the case in a country where no such direct responsibility attaches to popular leaders to carry into practice what they preach on the Platform. Being always in Opposition, they unavoidably developed a negativist philosophy which mani-



feats itself in steadily refusing to agree, and almost without thinking; so that very little room is left for doing constructive work.

That situation is now also changing. The leaders of the people are called upon to shoulder the responsibility of government for the welfare of the people in their daily life. But the top ranks of these leaders consist today inevitably of those who were schooled and seasoned all their life in the traditions of mere opposition and the negative philosophy of obstruction or refusal. Here and there some particular dogma may be selected for implementation. But that inevitably has to be carried out by agents and subordinates, who, until the other day, were themselves born and bred and nurtured in a totally different system of Government. Accordingly, even where ideals are high and intentions sincere, there is a great hiatus between those ideals and the results obtained. Faced, however, directly with responsibility as popular leaders of political parties are, it is not too much to hope that the full sense of responsibility as well as of the potentialities of the country will soon come upon them; and that, in response to that sense of responsibility, in acknowledgment of the country's potentialities, and as an earnest of their own sincerity, a comprehensive and scientific Plan or Programme of National Development will soon have to be undertaken and carried out, for the progressive improvement in the standard of living of the average citizen.

### **(iii) Handicap of Heavy Indebtedness**

These are all heavy handicaps of a personal character. Those of a social, organisational, or economic character which affect the entire agrarian economy are no less effective in moulding the destinies of India's rural masses. The burden of debt, for instance, and the toll of the money-lender on account of interest and principal, have, throughout the last century or more, constituted a handicap, the full magnitude of which is scarcely realised even by those who talk most glibly about it. No one knows exactly the total or real burden of debt resting on the Indian agriculturist,—not only as to the aggregate amount of the debt, but also,—and more particularly,—the interest and other connected or consequential burdens, direct as well as indirect, which the peasant has to bear. The Central Banking Enquiry, for instance, estimated the total of the

rural indebtedness in India in 1930 to be something like Rs. 900 crores. The admitted rate of interest on this was anywhere between 15 per cent to 75 per cent. It would be much more if we include direct as well as indirect burdens forced upon the agriculturist by the money-lender. In the years of Depression that followed 1930, agricultural prices fell so low, and the fixed cash charges of Land Revenue and interest remained so unchanged, that in all probability that burden must have been very much increased since 1930 even assuming the figure given by the Central Banking Inquiry Committee to be correct. Very probably at the beginning of 1940, the total of agricultural indebtedness was not less than Rs. 1500 crores, with an interest charge of not less than Rs. 200 crores per annum.

In the war years, and following the inflation in prices, it is claimed in some quarters that the agriculturist must have benefited, and repaid a substantial part of his debt. Prices, however, have risen not only of agricultural produce, but even more of the commodities consumed by the agriculturist for carrying on his business and maintaining his family and himself. Agricultural prices were, moreover, artificially kept down by a system of rigid control, fixing the ceiling prices and rationing, which, however commendable, must be acknowledged to have restricted the opportunity of the agriculturist to make excessive profit and thereby repaying oldstanding debts. We shall consider in another connection the nature and technique of price control. Here it is important to note that such controls restricted the producer's chance for profiteering, the more so as the Agriculturist as a class is unsophisticated, and unused to the devious ways of black-marketing. There may have been hoarding; but as against that there was compulsory levy in grain or kind, and forced procurement of the cultivator's surplus grain which must have further hindered the fullest advantage being taken of increased prices. If prices of agricultural produce have not increased so much as those of the articles consumed by the rural community, it may be questioned whether there was any surplus during the war years for the agriculturist to repay any considerable part of his debt. But even granting that some repayment has, in fact, happened, it is still open to question if the present burden of indebtedness is substantially much lower than in 1930. The Agricultural Debtors' Relief Acts also brought a measure

of relief for the peasant; but the money-lender is an adept at devising new ways and means to evade the law when he cannot get satisfaction from the High Court or Federal Court to get such legislation declared ultra vires the law-making authority. This ancient and intolerable handicap must be first removed effectually before agricultural production can be expected to show a substantial increase.

#### **(iv) Reorganisation of Agrarian Economy.**

Reference has been made, time and again, in this volume as well as in others in this section of the National Planning Committee's Sub-Committee Reports, to the urgent necessity of reorganising completely the agrarian economy of the country as a condition precedent for a substantial increase in agricultural production, and its better distribution. Space need, therefore, not be taken up at this stage for pointing out once again elaborately the need for a compulsory universal reorganisation of the entire rural economy and for all its activities. While, however, the regime of free enterprise and individual initiative remain unchanged, there is every reason to fear that various handicaps like excessive fragmentation of land and consequently wasteful cultivation resting upon the Indian peasant will not be effectually removed, unless from the root upwards the organisation is changed and placed on a co-operative basis. For the spirit of co-operation certain conditions are, no doubt, pre-requisite; and it may be questioned if the Indian peasant exhibits any of these conditions to the degree necessary for working a co-operative organisation efficiently and successfully.

#### **(v) Small and Scattered Holdings**

The same logic will apply to such features of modern agrarian economy in India as the extremely small unit of cultivation. The very small size and immensely scattered character of the total land held by one individual cultivator are fully dealt with in the volume dealing with Land Policy, and in other cognate volumes. Remedies have been suggested for preventing more fragmentation of agricultural land and for consolidating so much of it as comes actively under morcelment. The remedies will have to be spread far and go deep into the very roots of our social system. Public opinion, or such of it as exists, is unanimous as

regards the need for such reconditioning; but very little active steps seem to have been taken to achieve the objective or reconsolidating the scattered holdings, and preventing further dismemberment.

#### **(vi) Technical Education**

Lack of technical education amongst not only the present tillers of the soil, but also among his immediate successors is a handicap easy to remove, if only a determined effort is made to spread technical knowledge by all methods and means available and once again with a definite view and purpose. While it lasts, however, it inevitably makes the country's agriculture backward and unprofitable.

#### **(vii) Absence of Subsidiary Occupation.**

Perhaps the greatest of these handicaps, inherent in the present system of rural economy of land cultivation, is the absence of any co-ordinated arrangement for alternative, substitute or supplementary occupation for the agriculturist to make up the deficit for his maintenance which uneconomic cultivation on fragmented holdings involves. Agriculture is a seasonal occupation, which leaves the tiller unemployed in months when there is no cultivating operation to engage him. The reorganisation of agrarian economy, mentioned above, must see to it that this large gap in the utilisation of the labour resources of the country is filled by organising and developing subsidiary or alternative occupation to agriculture to get over this severe handicap. The emphasis laid by Mahatma Gandhi during all his life on the encouragement of handspinning and weaving was born of his keen realisation of this defect. It was the most considerable alternative or supplementary industry, which was all the more commendable because it concerned another necessity of life. If the peasant could make his own clothing, he would go a long step forward to economic independence and self-sufficiency.

It may be questioned how far, in this age of industrialisation and intricate division of labour, the logic of this emphasis could be carried. But none can question the need for organising and developing alternative and subsidiary industries, which would occupy the spare time of the cultivator, or take off the surplus pressure upon the soil which today inevitably accentuates the heart-rending

poverty of our people. The Volume in this Series on Rural and Cottage Industries deals with this question more fully; and so we need not labour the matter any further here. But, at the risk of repetition, we must insist on the need to create full employment for the adult population in our lakhs of villages; and so add to the volume of goods and services without which the country must remain poor and backward, and its standard of living most rudimentary.

### **(viii) Handicaps on the Land.**

Not only the tiller of the soil; but the land itself also suffers from many and heavy handicaps which retard the progress of agriculture. These have been admirably summarised by Dr. Burns in his work frequently quoted in these pages. In the final chapter entitled "The Shape of Things to Come", the author of the Technological Possibilities of Agricultural Development says :—

"The function of agriculture is to supply nourishing food for the people, and good quality raw material for industry. In agricultural developments two objectives must be held clearly in view: (i) the abolition of the poverty of the people; and (ii) the abolition of the poverty of the soil.

Increased acre-yields are the indication that we are attacking simultaneously both kinds of poverty. Increased net returns to the cultivator in cash or kind mean that we are getting these increased yields at a relatively lower cost. A good beginning can be made by cutting out several kinds of waste, and substituting parallel kinds of savings. These are, waste of fertilising material, waste of water, waste of time, waste of labour, waste of soil, waste of money, waste of live stock. Each of these heads covers a good deal more than appears at first glance. Waste of soil, for example, covers uncultivated (though cultivable land), land cultivated too seldom, land cultivated with an unsuitable crop, land that goes to the sea in floods, land fragmented. Waste of water covers water that goes to the sea, that might be pumped, water that runs off the land that might be impounded, water spilt at the wells by inefficient water lifts, water from canals given in excess, failure to tap underground water by means of wells, and so with the others." (pp. 119-120).

In the preceding pages, suggestions have been put forward for arresting all these several kinds of waste, inefficiency or uneconomic cultivation; as well as remedial measures which would, besides making the savings against such waste, positively add to the value of the land, or the return from it, in quality as well as quantity. There are other volumes in the Series, which deal more specifically with particular problems, e.g. waste of soil or water; or possibilities of safeguarding and improving our cattle wealth, and their yield in the shape of milk, meat, wool, bones, hair, hides and other by-products or even manurial possibilities. We need not, therefore, repeat at this stage the steps and devices which would be needed to speed up all possible advance in this most important source of new wealth in this country.

At the risk of repetition, however, mention must once again be made of improved organisation to facilitate all these remedial measures, and safeguarding devices being tried out. Dr. Burns thinks only of the official, or departmental, aspect of the national problem of reorganising the entire agrarian economy for the intensive development of agricultural wealth. Official and expert agency would, no doubt, have to be improved and multiplied. But the real strength and source of improvement of this nature must come from the people themselves. We have been accustomed too long to have things done for us and our problems solved for us, by an outside agency. We are now, however, no longer in the age of benevolent foreign bureaucracy, and claim to have established a regime of democratic freedom. It is of the essence of democratic self-government that the people must learn and be given opportunity to help themselves, to organise for their own advantage, and to act until that advantage is attained.

The rural reorganisation, therefore, that has been outlined in another volume in this Series, and which must be regarded as absolutely necessary, is based on substituting the co-operative for the competitive principle, and extending it to all activities and aspects of our agrarian economy. That is much more likely actively and enthusiastically to enlist popular support for such measures of their betterment and ensure the betterment achieved to be abiding and substantial, than any improvement in the departmental machinery, and additions to the number of officials.

### **Ways and Means of Improving Food Supply.**

Having reviewed the area and yield of the principal food grains as well as other crops in the country, and having made allowance for the political vicissitudes that have occurred in the last half generation, the problem before the Planning Authority seeking to attain National Self-Sufficiency in all matters of essential requirements for the people, let us see where and how the available supply of these primary requirements can be increased. They must be raised, in a proper Plan, up to a pre-determined level, which would ensure a reasonable standard of living for the people. The problem of food supply would thus be considered not exclusively as an emergency or priority of the moment; but it must be examined and solved with reference to other facets of national economy. It must, at the same time, be viewed in the perspective of ordered growth and planned development for all parts of the country, all sectors of its economy, and all items or stages in the Plan. The present emphasis on securing adequate food supplies must not be ignored; but it must be seen in its correct proportions, which are apt to be unduly magnified in an emergency. The reasons for the present shortage as noted elsewhere are both deep-seated and enduring. If an attack is made on the problem as a whole, it certainly cannot overlook the primary need of food supply for a growing population, and an improving standard of living of that population.

### **Industrialisation and Agriculture.**

But even so it must be premised that an increase in food supply cannot or should not be achieved at the expense of the area now devoted to what are called "cash crops", or, better still, what may be called crops relating to raw materials of manufacturing industries in the country. Under a proper scientific Plan, seeking to achieve national Self-Sufficiency in as high a degree as possible, we can no more depend on imported food than on imported raw materials of our industries. Both are equally important, and must be equally provided for.

Real and lasting improvement in the standard of living of the people cannot be effected without a rapid and substantial industrialisation. This means the expansion of existing industries to a stage at which they meet at least the local demand for the finished goods, or use up

the locally produced raw materials, whichever goal is accepted as its objective by the Planning Authority for the purpose. This would involve extension or expansion of those existing industries, by technical or mechanical as well as quantitative improvement, which may help us to attain the goal indicated above; and establish new industries which at the present time are quite possible to start but not established. It is notorious the country is lacking in many important industries, which otherwise have every facility prerequisite for their establishment in the shape of raw materials required, the necessary labour supply, and adequate local market, and other accessories of commercial success.

If these industries are to be developed up to the point that the obvious opportunities and facilities available suggest, and suitable new ones established, the area devoted to the production of raw materials necessary for the success of these industries cannot be reduced any further. The results of the last two or three years Grow-More-Food-Campaign under the impetus of the War, have already indicated the cost they involve of reducing the area under industrial crops. That may have been unavoidable in face of a sudden emergency and acute shortage of the primary means of life. But in a planned national economy, with long range coordinated arrangement, this cannot but be regarded as excessive from the point of view of a balanced national economy and its integrated progress simultaneously on all fronts. If the pressure of population, moreover, which today presses unduly on the resources of agriculture, is to be relieved; and what may be called the surplus population transferred to other occupation and other productive employment, it is imperative that the industries must be developed to their maximum potential. And as one of the pre-requisites of such development is the supply of suitable and adequate raw material in the required quantity, the area now devoted to their production can no longer be reduced.

### **Increasing Area.**

This point will be still further developed in a later section where Industrial Crops are more individually considered. In this place it is important to add that if more area is not available to the production of food crops, as was the case during the war years, and if at the same time it is postulated that more food is necessary for the coun-



try, only two directions seem to be open for securing that objective. On the one hand, there is the possibility of bringing under the plough those stretches of land surface now lying fallow and regarded as culturable waste. They need to be reclaimed; but when reclaimed, they would make a substantial addition to the area available for cultivation.

In other volumes of this Series, this subject has been considered from the appropriate angle, and some attention is given to the amount of Capital and Labour that would be needed for reclaiming, developing, and bringing such land under the plough, whether for food crops, industrial raw material, or other cash products needed for export. The programme of reclamation will consist not only of taking up land; but its equipment with all the necessary drainage, water supply, buildings and other accessories of cultivation, such as tools, implements, machines etc., which may be necessary for the proper utilisation of this land.\*

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\* In the Final Report of the Foodgrains Policy Committee, 1948, Appendix E, and F, (Pages 29 to 40,) Mr. D. R. Sethi, Agricultural Production Adviser to the Government of India, has worked out an outline scheme to bring 2 million acres of culturable but uncultivated land, as also 1 million acres of old land lying fallow, under the plough, on a cooperative basis. He has laid down certain conditions precedent to utilising such land, and given detailed figures of the capital cost of reclamation and of cultivation as well as the prospects of yield. For 2 million acres of culturable but uncultivated land, brought under cultivation he estimates the cost to be somewhere about Rs. 48 crores and the value of the outturn at Rs. 58.80 crores; while for one million acres of old land remaining fallow because of its being infested with weeds, he calculates the capital cost at Rs. 4 crores, and the value of the yield at somewhere about 5 crores per annum. The statement is too long to reproduce here in extenso; but it is highly illuminating and extremely helpful as a guide to the possibilities of increasing food supply in the country by adding to the area under cultivation as also to the liabilities for capital and current expenditure which would have to be incurred in connection therewith.

In his Dissenting Minute, Dr. V. K. R. V. Rao takes the capital cost of 2 million acres of hitherto uncultivated land to be about Rs. 20 crores for the actual reclamation, and an additional expenditure of Rs. 40 crores of further capital cost for equipment needed for farming, roads, buildings, malaria control operations etc. Without this latter it is, of course impossible to cultivate the land which is cleared of jungle, shrubs, etc. For reclaimed land to be really usable for cultivation, this expenditure is no less essential. The total cost may, therefore, be taken at Rs. 60 crores, or Rs. 300/- per acre of uncultivated land brought for the first time under the plough. It is estimated to yield 2.3 million tons of cereals. On

Some of these matters are considered a little more fully even in this volume later. Here we must add that in this direction lies a very considerable chance of adding to the land area of the country available for cultivation and brought actually under the plough. How much would be such new area brought under the plough; and how much it will add to the food resources of the country in the near future is only guess work. Judging from the productive capacity of neighbouring land under similar crops and conditions, and considering the possibility of improvement in the unit yield which better methods of cultivation and better measures of agrarian economy may lead to, it is not too much to expect that the food resources of the country may, in the course of five or seven years, improve from 33 per cent. to 50 per cent.

Another set of measures in the same direction and for the same objective relate to the reorganisation, **ab initio**, of the entire agrarian economy of this country. In several other volumes in the Series, particularly that relating to Land Policy, schemes have been outlined for reorganising land holding and cultivation in some form of compulsory Universal Cooperative Societies, whereby most of the handicaps and uneconomic burdens from the peasantry may be avoided or remedied; and the inherent advantages may be intensified. It is unnecessary to repeat those arguments in this place. But the moral cannot be repeated too often and lost sight of for preparing a comprehensive scientific plan of national economy. The possi-

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the other hand, one million acres of fallow land once cultivated but now abandoned is estimated by the same authority to cost Rs. 4 crores and yield 750,000 tons. The Committee have estimated the total shortage of foodgrains in the country at 10 million tons, which they propose to make good as to yield 4 million tons from large-scale multi-purpose irrigation projects adding 19 million acres of new land and as to another 3 million tons by implementation by Provincial Governments of their Five-Year Plans. Taken with the yield from reclaimed land this would mean an addition of 10 million tons to our foodgrains supply in 10 or 15 years. Dr. Rao, however, prefers the reclamation or re-cultivation of fallow land, now abandoned because of its being infested with weeds, to undertaking large-scale campaign for reclaiming uncultivated cultivable waste. The latter would involve in his opinion considerable strain on foreign exchange and make us dependent on foreign material for carrying on those reclamation operations. He is not in principle against adding to the total area of land under cultivation and therefore to the total available foodgrain supply by such means.

bility of increased yield by means of reorganised land holding and cultivation has also been indicated in other volumes, and so the same ground need not be covered too closely once again.

### **Increasing Yield by Better Seed.**

Apart from the increase in the actual land surface available for and brought under cultivation, there are other ways by which, if not the same degree, at least a material improvement can be made in the food supply of the country. While reviewing individual crops, mention has been made of the improved quality of seeds which would not only resist pests, and be free from many of the diseases that affect certain plants; but which under proper methods would yield better and bigger quantity of particular grains of food supplies concerned. It is unnecessary to repeat the considerations there advanced. Viewing, however, the problem generally, it may be added that the amount of land now brought under improved seeds, is almost negligible when we consider the food crops. Commercial crops or those forming raw materials for industry have no doubt got the benefit of improved seeds, as for instance, in cotton or sugar. According to a Table prepared by Sir John Rus-sel ten years ago, the percentage of land under improved seed in regard to—

Sugar	was	..	80
Jute	„	..	50
Wheat	„	..	20.6
Cotton	„	..	19.2
Rice	„	..	4.3
Groundnuts	..	..	3.4

According to the Final Report of the Foodgrains Policy Committee, 1948, experiments on the use of improved varieties of seeds have shown that improved seeds raise the yield per acre by about 10 per cent. Not much progress has been made in the direction of bringing larger areas under principal food crops under improved varieties of seed. The following Table gives the latest position:—

<u>C r o p .</u>	Area under improved seeds.	
	Estimated area under improved seed (in millions of acres) in 1938-39.	Estimated percentage of area under improved varieties in 1938-39 for rice, wheat, jowar, ground-nuts and gram.
Rice	4.5	6.2
Wheat	7.9	22.4
Jowar	0.6*	1.1*
Groundnuts	0.6	6.7
Gram	0.2	1.6

\*Figures for all millets (jowar, bajra and ragi), but mainly jowar.

Of these only wheat may be regarded as a food crop, though, as explained elsewhere, its commercial value when exported used not to be negligible. It is now however largely imported. Millets, Gram and other similar articles occupy less than 1 per cent. of area under such improved seed.

In the case of commercial crops, no doubt, Scientific and Technological Institutions have special departments to do research in a variety of seeds to suit particular conditions in different parts of the country or in different climatic or other conditions. In the case, however, of food crops, the mass of the cultivators are too poor, or too ignorant, to be able to afford the improved varieties that such Institutions breed. No doubt, Institutions like those at Coimbatore, Pusa and some other stations help in securing improved varieties for several food grains and they have shown good results. Nevertheless, in proportion to the large number of people affected, and the large extent of area concerned, the degree of attention devoted to this aspect of the problem is insignificant. Provincial Departments and the Ministry of Agriculture have not sufficient time or the staff to bring about improved varieties of food seeds; and still more to distribute them effectively and make them available with full explanation to the cultivator for raising the new crop. If the food supply of the country is to be doubled or trebled within a measurable distance of time, it is imperative that the Technological Institutions devoted to agricultural research should take up these problems also much more vigorously, give the fullest publicity to the results obtained, and dovetail them in the general Plan affecting the agricultural as well as the industrial sector of national economy.

### **Control of Pests, Diseases and Depredations.**

The yield and quality of Crops in India,—both food grains and industrial raw materials—suffer heavily from the ravages of pests like locusts or vermin or weeds; plant diseases affecting given crops in given areas, like rust of wheat; and depredations of birds, wild beasts and even cattle. Exactly how much is the loss on this account is impossible to estimate. But we would not be far wrong if we take it to be about 10 per cent of the crops grown.

This is nothing new in the history or practice of Indian Agriculture. The average cultivator is not unaware of these handicaps; nor is he quite innocent of the measures appropriate and effective to check the loss due to this source. But his means are limited and devices rudimentary. If a really planned, coordinated and scientific attack is to be made on these evils, it may result in improving the total as well as the unit yield in the several crops listed above, very substantially. Pests need to be located and dealt with by germicides or antidotes to rid the fields of them as soon as possible, even if they cannot be prevented in advance. Plant diseases need to be studied, and remedies devised in our laboratories or demonstration farms. This is a matter as much for scientific investigation and remedy, as for popular devices and traditional ways to be brought up-to-date so that diseases must be prevented or remedied. The loss of crops due to birds, vermin, weeds, etc. is as explained elsewhere, a very serious one. Merely safeguarding against these vandals would add (or save) as much as 10 per cent to the supply available within the country; while effective antidotes would mean improvement both in volume of crops and their quality.

The fight against pests and diseases would be greatly facilitated, if an improved variety of seed is discovered and utilised. These must be distributed with full explanation to the cultivator, so that the peculiarities of the improved seed may not become a new burden and handicap coupled with the inherent strength of seed and soil, the results may be very substantially beneficial. Proper treatment of the soil and improved methods of cultivation may also help to guard against the attack of particular pests, like weeds. Better drainage and suitable regulation of the season or date of sowing in accordance with the character of such pests would help either to avoid the pests, or effectually counteract them.

The problem of rust in wheat, for instance, has been effectively tackled by rust-resisting seed developed by Prof. Mehta. Similar achievement has also been made in regard to Linseed resisting wilt. In the case of sugarcane, again, the borer, which has affected as much as 35 per cent or more of the cane, can be guarded against by improved variety which has increased very substantially the yield of the sugarcane.

The possibility of biological control over vermin, or their extinction by counter vermin, so to say, has been demonstrated already in many cases by similar scientific advances. In Canada a large fly affecting the peach and other crops has been successfully controlled by new parasites which live upon these vermin. These, however, are not always effectively kept under check as the experiments in such advanced countries, like the United States, prove in regard, for instance, to the gypsy moth or the corn borer.

Control of insects and fungus is not simply a matter of scientific investigation. It involves difficult educational and administrative considerations. The use of counteracting devices pre-supposes a degree of education, not only amongst the leaders of the agricultural community, but also amongst the actual farmers, without which those modern helps to cultivation may be converted into handicaps. There is a deep-seated prejudice, particularly among the more ignorant peasants, against these new fangled devices as they call them. They become consequently useless. Until a proper knowledge of the nature and use of these devices spreads amongst the people, and unless and until every farmer perceives his own interest in adopting such methods, devices or treatment, the utility of biological control against pests and vermin will be limited.

The spread of information about the possibility of counter irritants so to say, breeding of parasites, and the use of other material must be the task of every central organisation, as well as of local authority concerned with agriculture. We are lacking very much in adequate publicity. Even as regards that section of the population which can read and write, matters directly connected with their own trade are seldom seen in their proper scientific light. The agricultural population is proverbially backward. And if that section is to be really and fully benefited by the advances or discoveries of modern science and tech-

nique, it is imperative that all the latest devices of the cinema and the radio as well as printed matter must be utilised to the utmost to spread proper knowledge of such matter, among the people concerned; and make them understand and utilise the modern magic of material science to aid themselves and multiply the fruits of their industry.

At present much of this information, moreover, used to be conveyed in English, a foreign language. That fact alone makes the new knowledge unavailable to those really concerned. Local language alone is the proper vehicle for such information if it is to be truly fruitful. It is not merely a political prejudice that demands this reform. It is the sheer necessity of the situation which insists upon such changes, without which there can be no hope of a national resurgence.

The measures of control in regard to both pests and diseases are taken generally under the auspices of the Indian Council of Agricultural Research. That body makes grants to the provincial workers for studying plant diseases and pests. It has been suggested that this could be improved by taking up specific crops and their diseases by specialists. Cotton and sugar cane have already been dealt with in that manner with excellent results. The Council can carry out the experiments and make the results available to and for the entire country.

On the other hand, we might leave the special study to the Imperial Research Institute or the various bodies now being developed for scientific and technical research. The tendency today seems to be to gather together, in some central institution, studies and researches of this kind so as to intensify and maximise results. The method seems to be more economical as well as effective in the long run. But the executive action in regard to dealing with pests and diseases must naturally belong to Government whether central or provincial as the case may be. The same argument applies to the case of weeds which affect several parts of the country and particularly to crops.

### **Better Water Supply.**

The next important direction in which agricultural production in this country may be substantially increased is the adequate, regular and timely supply of the necessary

and appropriate water. This subject has been dealt with in more than one volume in this Series. It is considered here, not merely from the standpoint of the actual supply of water, but also from the point of adjusting its quality and quantity as well as the period of supply for the different crops, and the nature of the region concerned.

The problem of water supply viewed from this angle is naturally different in regions where dry farming is practised, and those where wet farming is in vogue.

In the case of dry farming the problem is not so very difficult. What is needed is some trained soil physicists and soil engineers, as dry farming is concerned closely with soil erosion. In regard to wet farming where adequate supply of water is necessary, it has been pointed out in other volumes in this Series that large-scale Irrigation Works or Canals, as well as Wells and Tanks on a more modest scale, have from time immemorial assisted crop raising in this country. Large-scale canal water, however, is of a given character, and may or may not be suitable to particular types of soil or crop. It raises the problem, therefore, of selecting the proper soil; or alternatively providing suitable seed variety, which would flourish under the canal water available. New or hybrid seeds are produced in many parts of India, and their inter-change should be freely arranged. The designing of new crop schemes are also a necessity, if the canal has to serve its end properly over all its length.

This river water, again, even when it is perennial, is not continuously supplied. More water is available at some seasons and less at others. The crops must, therefore, be so arranged that the best use can be made of water as and when it is available, as well as the human and manual labour connected with the soil.

At the present time new and vast irrigation works are being projected in all parts of the country. These multi-purpose river training schemes will reclaim lakhs, if not millions, of acres of land and add them to the area under cultivation. It is important that when new canals are thus developed, and new land thus reclaimed, adjustment of the soil, crop and water be carefully considered in advance. The more impressive magnitude of these schemes in generating electrical power and developing industries by its aid in the region watered by such rivers may quite possibly over-shadow the minor but no less



important matters of irrigation that result from such schemes. It is to be hoped that these schemes, when carried out and completed, will not create new problems whether of water-logging of these fields, or soil erosion, or alkali deposits, which are said to mar a good deal the effectiveness of the canalisation of the Indus after it passes the Salt Range.

Well and Tank water may not raise these problems. Water supplied from Tube Wells is open to much greater and more effective control. It is supplied directly to individual farms, and so admits of greater flexibility in the crop schemes. Here also the main problem would be adjusting the time factor, and water supply to each crop according to its needs both as regards the time and the quantity of water.

### **Soil Preservation.**

Another set of problems that arises are those in connection with soil. Mention has just been made of the danger of water-logging of land irrigated by large-scale canals, and also by the deposit of neutral salts. These are passible to control and counteract. But the treatment needed is likely to be very costly. It has been remarked that "behind every large-scale irrigation scheme, there lurks the spectre of the alkali problem for which, in its final stages, no economic solution has been found . . . . It may be laid down as an absolute rule that no irrigation scheme should be carried out until a proper soil survey of the region has been made." This advice of Sir John Russel in the Report on the Work of the Imperial Council of Agricultural Research, is well worth bearing in mind by the National Planning Authority.

For a careful study of all these and connected problem a Central Irrigation Station was recommended, which has since been established, and a Central Irrigation and Water Works Board.

### **Soil Erosion.**

Closely connected with this matter of water supply, is that in connection with the preservation of the soil on which crops are to be raised. One of the greatest dangers to which cultivated land is exposed arises from the periodical floods in our principal rivers by excessive rainfall, or heavy melting of snows. Another source of such danger

is the removal of vegetation, whether for human needs or by excessive grazing of cattle, or by wild animal depredation. A special volume in this Series has been devoted to Soil Erosion and Afforestation; so that we need not take more space here for considering these problems.

Mention, however, must be made of the fact that, in several parts the removal of the soil due to floods or such other contingencies, makes the area thus affected useless for future cropping. What is worse is that the area thus drained away may result in deep ravines that may affect agriculture in the neighbouring fields as well. The soil that is washed away is a total loss to the country. Millions of tons of precious soil is lost every year in deltaic land where rivers cut very deep ravines and are therefore liable to serious flooding. It may even injure the neighbouring land, if it is deposited there instead of being carried away to the sea or lost altogether. Even if it is carried away to the sea, it may do damage by silting up the river harbours as has happened in the case of Broach or Surat on the west coast of India, or may result in choking up canals or rivers as has been experienced along the region drained by the Indus and its canals.

### **Denudation and Reafforestation.**

While forests or other vegetation remain on the land, even if there is heavy rain the rainwater is soaked through and accumulates underground and so is available for future use by means of wells. Where, however, such cover is no longer in existence, and the land is denuded of all cover or protection, rain-water simply runs away, and is lost to the soil and crop for ever. The underground water, such as it may be, is no longer replenished, and the utilisation of this land by digging wells and obtaining their water in off-season becomes more than ever difficult.

To guard against this handicap, therefore, well planned schemes of reafforestation, contour-bunding, river-training, etc. become indispensable. The principal remedy against erosion is to reduce the velocity, and control the quantity of rain water running off the surface. This is most easily done at the top of the slope where the water shed commences. If by proper bunding or other such methods, water is collected and impounded its running off would be prevented. Ploughing along the contour lines instead of across them, and bunding or terracing all

land, must go side by side with the other measures so as to guard against this great danger to the soil of India.

Control of grazing to prevent too rapid exhaustion of vegetation and the use of forest produce by the peasantry around is no less important. A word on this subject has been said while discussing fodder crops. Our cattle are badly nourished; and so notwithstanding the large number of cattle in India, the yield in the shape of milk or meat is very poor. Careful, scientific regulation of grazing grounds and fodder crops are, therefore, no less important in planned economy and integrated development. But for details of this and connected remedies reference must be made to the volume dealing with the subject proper.

### **Manure.**

Apart from these measures connected with the wealth of the land, or the supply of water and seed for raising the quantity and quality of crops grown, there are measures that deal with the quality of the land proper, that is to say with its chemical and physical properties so as directly to minister to the amount of crops raised. The chief of these is the adequate and appropriate manuring, or applying such organic and inorganic matter back to the land which each crop takes away from it. As has been mentioned time and again, agricultural land has been in cultivation in this country from time immemorial; and as such it is liable to be exhausted unless replenished from time to time by the return to the soil of those properties which it originally possesses. The traditional device of manuring land by night soil or farm yard refuse has yielded good results. Cattle droppings could, however, be not so fully utilised owing to the use of dung for fuel. Even town refuse and night soil is more wasted than utilised to enrich land.

Recent projects for providing artificial fertilisers may have their own utility. Agricultural scientists, however, seem to be agreed that the bulk of the crops customarily raised in India would benefit more by organic manure, that is to say the night soil of the big cities or the droppings of cattle, than by artificial manure produced by large factories. Admitting, however, their utility in intensive farming, artificial fertilisers must be treated as public utility concerns; and as such the products will have to be supplied on such terms and rates as may, quite possibly,

not make of the projects themselves a commercial success. Its indirect contribution, however, to raising the wealth of the country from the principal primary source of production is so great that the community may well bear a part of the cost in raising and distributing such fertilisers as a matter of common obligation.

The Indian cultivator seems to be fairly well acquainted with the appropriate season and also the nature of the manure to be applied to a particular crop he is raising. If this is to be further facilitated, it is important that an organised scheme be adopted for collecting and distributing such manure from the cities as well as from farms. The method of co-operative reorganisation of the entire scheme of agrarian economy, suggested in another volume in the Series, viz., that on Land Policy would go a long way to solve the difficulty which the smaller farmer meets with in collecting by his own effort the organic or artificial manure that his crops may need. The possibility of fish manure especially for some fruits stands in the same category and needs the same treatment.

### **Tools and Implements of Cultivation.**

Improvement in tools and implements of cultivation has been suggested ever since public attention began to be directed to scientific cultivation of land. The problem, however, is complicated, here as in other facets of our agrarian economy by the excessively small scale of cultivation in India, and the consequent inability of the cultivator to provide himself with the necessary tools, implements, or machinery which may be labour-saving and more effective in raising crops, but which are beyond his means to acquire and even if acquired to work economically. For improved tools and implements include machinery of all types which would be most serviceable only if the unit size of the fields is substantially raised. Here also the reorganisation of agrarian economy on some such lines as has been suggested in the volume on Land Policy seems indispensable, if the best is to be made of the yield from land in this country.

### **Rotation of Crops.**

The question of rotation of crops so as to make each successive crop so to say return to the soil what has been taken from it by the preceding crop, and so serve as mutually supplementing factors is not receiving all the

attention that is its due. While considering individual crops some observations have been offered as regards the rotation of particular crops and their mutual reaction. Wherever there is more than one crop on the same bit of land, the Indian cultivator seems to have evolved for himself some traditional method of crop rotation which yields satisfactory results, considering the conditions under which the Indian farmer has to work. A more scientific and country-wide arrangement for rotation of crops with a view to increasing the quality and quantity of either crop, will pre-suppose the carrying out of the measures suggested above without which a real and lasting improvement in the agrarian economy as a whole and the quantity and quality of the crops raised, their adjustment as between food, fodder, and other crops of industrial raw materials cannot be possible.

## CHAPTER VI.

### **Prospects and Policy of Food Crops in a National Plan.**

Having now reviewed the actual position with reference to the food crops in this country, we find that there is, no doubt, a wide and growing gulf between the Demand and the Supply of this material. The present standard of living of the people is very low even in regard to the primary need of food stuffs. The calorific value of the daily diet of the mass of our people would hardly amount to 600 to 800, as against the minimum of 2400 required for an efficient working adult in this climate. The amount and quality of the cereals and pulses usually consumed by the bulk of the people of India, are not supplemented by other more nourishing or body-building food material, as is the case with the meat-eating countries. The deficit thus becomes all the more a cause for anxiety, all the more a serious problem in national planning. All the calculations made from material available so far, induced the belief that, on an average, the food resources of India before the Partition were scarcely sufficient to provide even one meal, and one meal only, of the crudest, cheapest and scantiest type, per head per day; and that, too, without providing anything at all for the other needs of modern life, whether of the mind or of the body. This is the position if we take the average all over the country. The system of wealth distribution is, however, such that more than two-thirds of the people live much below that level of sheer starvation.

This situation has, if anything, deteriorated still further in the last quarter of a century. When Sir John Russel wrote about ten years ago, he could say :—

“Taking India as a whole, the physical resources of this Sub-Continent remain unimpaired.”

But today even that statement can scarcely be made with absolute correctness, so far as the Indian Dominion is concerned. Partition by itself has reduced the physical land surface available for cultivation in India. Th well watered lands of the Punjab and Sind, thanks to the intricate network of irrigation which has made those once arid lands now some of the most fruitful in the country, are lost, and with them a good portion of the cereal crops. Apart from this loss or diminution of the area sown, in the actual area available for cultivation, there is noticeable a steady

decline in the productivity per unit in cultivation. It is hard to say whether that decline is due to social factors, like the fragmentation and the scattered character of agricultural holdings arising out of our law of equal inheritance, or to the actual falling off in the physical properties of the soil. In the latter case man's science and ingenuity can devise, and has devised effective remedies. The results obtained by careful cultivation in given spots and by experiments in trying out different varieties of seed, providing the necessary water, manure, tools and implements as well as better organisation, it is obvious that physical deterioration of our land, even if it has occurred is of any significance. Other factors also, like the intensive campaign for growing more food to meet the special war-time emergency, may counteract the tendency to diminishing yield, by reducing deliberately the area devoted to cash crops, and improvement of that under food crops.

We must, therefore, ascribe the declining productivity of food crops in the aggregate to other than purely technical reasons affecting the yield from land. Famine in any considerable region within the country affects the yield from land under cultivation. Floods and other natural ravages, when they occur, bring about an impoverishment of the soil, and so cause a declining yield. None of these are, however, irremediable. Even social forces, like the law of inheritance and their economic consequences like fragmentation, can be effectually guarded against if only we have the courage of our convictions.

The most effective factor in widening the gulf between our food resources and the demand upon them, is the growth in population, which makes the demand far more excessive and progressively rising, while the resources remain either stationary or not improving as fast as the numbers rise. The phenomenal increase in the population of this country in the last generation inevitably makes a steeply rising demand curve, which is impossible to satisfy even with a stationary standard; while the supply remains stationary if not diminishing. Despite wars, famines and pestilences, the population of India, less Burma, rose, between 1921 and 1941, by some 10 crores, or over 30 per cent. If our numbers grow at 15 per cent per decade, by 1951, the population of the Union of India would be about 37 crores. If the amount of food grains remains what it was in 1943-44,—the year when the Campaign for

Grow-More-Food was at its highest,—the present deficit will appear still greater and greater.

Moreover, a certain proportion of the population, those engaged in industry or living in towns, have a much more effective demand owing to the higher money wages that they get. These numbers may not be more than 10 per cent of the total population; but their demand is twice as effective as that of the corresponding number in the rural areas. Coupled, therefore, with the increase in numbers, the increase in the purchasing power of certain sections of the community, however small, but steadily increasing, inevitably makes the gulf,—already very considerable, between our total food resources and the aggregate demand for the same,—larger every day.

The actual crisis was brought about, in the middle of the war years, by a number of passing factors, which also served to stress the permanent divergence between our food resources and our food requirements. The famine of 1942-43 in Bengal was one such factor. It cannot, however, be dismissed merely as an occasional falling off in supplies; for famines are a frequent occurrence in this country, and unless and until comprehensive and co-ordinated steps are taken to insure the land wholly against famine, this menace of the food shortage in the country, cannot be treated as merely an occasional danger. The war itself, leading to an increased demand because of the need to provide food for the armed forces raised in this country or brought to it from the Allies,—India being the principal base of operations in the East,—made for an intensification of the food crisis. Finally the shutting off of rice imports from Burma after its conquest by Japan and other parts of South East Asia, also added to our shortage, and made the crisis more acute than ever.

On both sides, therefore, namely Supply and Demand, factors were at work which made the food supply daily shorter during 1942-43. It was, in fact, the cumulative effect of a number of forces all operating in the same direction, making the crisis acuter and acuter. The inevitable consequence was a rise in prices which was intensified by ceaseless inflation in currency. Because of prices rising, some stocks of grain, may have been hoarded by the producer. On the whole, however, the aggregate production, so far as estimates of this kind can be depended upon, was much below the needs of the country as a whole.



In the years before the War, prosperity of a country used to be gauged by its volume of Foreign Trade. Thanks to that outlook, no reserves had been built up even during our earlier years of better productivity, as all the surplus(?) grain used to be exported. After the separation of Burma, India began to import food on the balance. But the War and the scarcity of shipping due to its dangers, cut off that means of adding to our domestic produce; and rendered the building up or maintenance of a reserve impossible. We had, therefore, either no reserves of food, or very little to serve as a standby in the moment of an unexpected emergency such as was then occurring. While prices were rising due to a number of other factors, and stocks disappearing or being hoarded, the problem of exchange also became very acute. Perhaps the rise in prices was much greater than the disparity between the purely economic factors between Supply and Demand warranted.

The remedies suggested for such an acute and prolonged situation, and adopted by the then Government were all piece-meal; "sufficient unto the day the evil thereof" seemed to be the guiding principle. Each remedy was designed to meet, so to say, one particular facet of the problem. There was no co-ordination or integration. The several remedial measures were not woven into a single pattern; and so they did not succeed in the measure that would otherwise have been expected.

The most considerable of these remedies was to increase supply by shutting off such exports of food grains as were still at that time taking place; and to secure imports of the absolutely indispensable quantity. The minimum needed was fixed at about a million tons, with a further 500,000 tons to serve as a reserve. The scarcity of shipping space and the dangers of active hostilities made this proposal more than ever difficult to carry out during those years. Subsequently, however, imports have steadily increased, till in the current year (1948) as much as 2½ million tons are likely to be imported.\*

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According to the latest reports, for the first six months of this year something like 1.75 million tons of food stuffs, principally wheat and rice, have already been imported; while a target of 2.6 million tons was mentioned at a Food Ministers' Conference in July 1948.

As has already been pointed out in the preceding pages, it would be a serious handicap on India's National Economy, if she has to rely permanently, and as a normal feature of her national economy, in any considerable measure, upon imports of foreign food stuffs, whether to meet the current deficit or even to build up a reserve. It may be, that, for building up an initial reserve and to meet the continued crisis, such a course may be inevitable. But a real and permanent increase on supplies can only come by developing our own indigenous resources. In the section of this work relating to the Ways and Means for Improving the Yield from Land, several methods and devices have been examined. A good few of them are already being implemented. The results, however, of these will take some years to mature. The high prices, therefore, would continue for some years to come, while the other alternative remedies would have to be more and more depended upon.

The Food Grains Policy Committee of 1943, which, in the first place, made this recommendation, for securing imports, did not make any exact estimate of the total deficit in food supplies that had to be faced in India as a whole. Since the Partition of the country that deficit has, if anything, increased. The Final Report of the Food Grains Policy Committee in 1948, records—

“After a careful consideration of the matter of food supply, the country may set itself a goal of increasing production by 10 million tons annually as soon as possible with a view to placing the food economy on a sound footing”.\*

The calculations made in the earlier pages in this volume also indicate some such target having to be fixed, if any well designed coordinated or planned course of action is to succeed in bridging the gulf, and wiping off the deficit, if not immediately, then say in 10 years at the most. This, the latest body to report on the subject, has suggested three main ways for increasing supplies, viz:

(i) Bringing culturable waste land, 3 million acres, under cultivation, expected to yield in five years about 3 million tons of food grains. This subject has already been considered in this and other volumes in this Series. There is no doubt that here is a really effective remedy and a

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\*Paragraph 16—p. 6,

lasting cure, not only for the present shortage; but even to provide for a steadily rising standard of living expected to follow from carrying out a planned programme of intensive development. Our suggestions are, however, much more ambitious, advising as they do the bringing into cultivation every acre of culturable waste. This amounts to a very large acreage, and can add 25 per cent. to 50 per cent to our present food crops production, without any other improvement. It may take ten years or a little more; and involve considerable capital cost of development; but that is not beyond our means; and far below the results that can be reasonably expected.

(ii) The extension of several large-scale Irrigation Works, now in process of execution, was estimated to bring something like 18.7 acres under cultivation within 10 or 15 years at most. These are, besides, all Multi-purpose River Training Schemes, in which Irrigation is not the sole end in view. The prosperity they are expected to bring would be both agricultural and industrial. This source is expected to yield about another 4 million of food stuffs.

(iii) The balance of 3 million tons needed to make good the total estimated deficit, was expected to be obtained by cultivating 1 million acres of land now lying fallow, and implementation by the five-year plans of the various State and Provincial Governments.

If, however, our population goes on growing as fast as it has done in the last 25 years, and the standard of living improving side by side, the deficit would be much greater than 10 million tons a year and means devised to meet it. The devices just mentioned have been examined in the preceding pages, and so we need not dwell more at length upon the effectiveness of this remedy. Admittedly it must take time, varying from 5 to 15 years, in the case of the most ambitious projects for reclaiming land by multi-purpose river-training and large-scale irrigation. It must also take considerable investment of capital; but that will be spread over a number of years, and so the burden will not be unbearable; nor the capital resources of the country unduly strained. In the case of bringing culturable waste land into cultivation, there may be further difficulties of dependance on foreign imports and suitable equipment, which are difficult to procure. It is possible that in such a case undue delay may occur before results can be expected.

Meanwhile, if the present tendency in the growth of population continues, the 1961 figure may well be expected to be near 40 crores even for the remaining Provinces and States of India which now make up the Union of India. The food supply for that number with a ration better than is the case today, would have to be perhaps increased much more than laid down in the Final Report of the Food Grains Policy Committee. And there must be a proportionate reserve which at the moment it is difficult to say will have to be built up at an early date. Under a normal balanced diet, as recommended by Sir John Russel some ten years ago, and which may be taken to be valid even today, the following amounts of the several kinds of food would be required\*.

Item	Ill balanced diet.	Well balanced diet (Figures are in oz. per day).
Cereals	20	15
Pulses	1	3
Vegetables green leaf	2	4
"      non-leafy.	2	6
Fats and Oils	0.5	2
Fruits	nil	2
Milk	2	8

\*Cp. cit. Page 20.

At the worst stage of the food shortage, and in places most deeply affected, the ration was reduced to an aggregate of 12 ozs.\*\* of cereals per day per head; while the other ingredients of a reasonably decent dietary were either unavailable or beyond the means of the average family in the areas concerned. If the National Plan really succeeds in its main objective of improving the actual standard of living of the masses, a balanced diet, as recommended by experts, will have to be made available to all. The food supply of all kinds may, accordingly, will have to be raised by at least 25 per cent. or to some 70 million tons per annum. This is not impossible to achieve if all waste is stopped, and the positive remedies suggested above are energetically applied.

\*\* According to the Food Minister speaking in the Legislative Assembly in April 1948, "Over all rations were reduced to 10 ozs. and in certain areas the rations were between 6 to 8 ozs.".

Apart from increasing the acreage of land under cultivation by the several devices suggested by the Committee, the quantity of yield per unit could also be increased. Improving the seed and making it more suitable for the particular soil and climatic conditions, as well as effectively resistant to the common pests or diseases, and providing the necessary manure; the quantity of food grown may be increased easily by 33.1|3 per cent. More adequate and appropriate water-supply may do the same. Better organisation of the entire village economy would counteract all the handicaps of fragmentation and morcellément, and so make the net return to the cultivator appreciably greater. The wasteful and relatively unprofitable cultivation of today must be ended. And when all that is accomplished, the yield of the food resources will be substantially raised. In every case the potentiality has been reviewed in earlier pages, not only in comparison with other countries, but also as between the several regions of India itself, as also following upon actual experience gained by practical demonstration. There is very substantial room for improvement in quantity as well as quality; but exactly to what degree this improvement would occur will be difficult to say. For purposes of working efficiency, the food needs supplementing as shown in the balanced diet given above. That also would mean developing her own latent resources, or improving the technique, tools or accessories and subsidiaries which must form integral part of the Plan. Some methods of accumulation and building up a Reserve have also been indicated in the previous section and in another volume in the Series. All this gives ground to believe that the self-sufficiency in the matter of food is not impossible for India to attain.

Another suggestion, made in the first Report of the Food Grains Policy Committee (1943), emphasises the need for establishing in India an Artificial Fertilisers Industry, which would provide something like 350 thousand tons per annum of Ammonium Sulphate. By its aid it was expected to increase substantially the yield from the land actually under cultivation. Artificial manure will not, it must be added, be a substitute for organic manure provided by the farm yard or the night soil of the cities. Opinion is, in fact, divided as to the utility or possibility of chemical fertilisers under small scale Indian farming. But there is no difference as to the need of manure. It is a problem in organising the collection and

transport as well as making an effective distribution of the manuring material. That done, there is not much doubt as to the possibility of adding to our food supply from our own resources.

Improvement of tools and implements commonly used by the agriculturist; and for that purpose the relaxation of control measures in regard to iron and steel, was recommended as among the remedies designed to meet the emergency of 1943. That position still remains substantially unchanged. A Factory for producing Artificial Fertilisers has been established at Sindri. But the real service of that factory remains yet to be proved.

### **Rationing.**

These were all means to increase the total food supply of the country, immediately as well as in the long range and permanently. The most urgent question, however, in 1943-44 was a better distribution and fuller utilisation of the food supply available in the country or imported from abroad. This was not only a warborn problem, nor a passing emergency. Though the War has ended these three years and more, the situation is daily worsening. Measures and arrangements for husbanding the available stocks, and organising their distribution so as to share equitably the available stocks became inevitable. These measures took a variety of forms, which were collectively known as Control.

Rationing came as the most considerable form of the policy of Control, and intended as a remedy to relieve the acute scarcity. Since its introduction, it has been increasingly applied in the years that followed, though it was originally meant only as a solution of the then prevailing emergency. It came in successive stages gradually spreading in area and strengthening in intensity. Inevitably it went from step to step, till it embraced quite a fair proportion of the population, and a large list of articles. According to the Interim Report of the Food Grains Policy Committee of 1947-48, the extent of statutory urban rationing covered something like 27 million souls, or about 10 per cent of the population of the then British India; while non-statutory and rural rationing, or controlled distribution of foodstuffs, applied to a total of something like 103 million people. Meant in its origin to secure a more regular and more equitable distribution of the avail-

able food supply, and not allow it to be monopolised by those who could afford to pay the sharply increasing prices even if they could not consume the whole of that quantity, while those who could not afford those prices were left to starve, the Rationing system soon revealed its inherent defects and difficulties, particularly under a regime of individualist economy. This necessitated a consideration of the areas where there was believed to be surplus food supplies over the requirements of the areas concerned, and these other areas which were in deficit, that is to say, whose own production was below their own requirements. This surplus or deficit may be in reference to all grains or any particular grain, which was in wide demand by the population of that region. After preparing a list of these areas, arrangements were made with the surplus areas to bring their surplus into a common pool, to distribute it to areas which were in deficit. For giving effect to these arrangements, transport facilities, or priorities, had to be next provided. Next came the yet more difficult task of actual distribution in each locality covered by this system. Specially authorised ration shops had to be opened, definite ration fixed, and other regulations drawn up to enable the entire mechanism to function. For the shops to operate properly, they had to be provided with a modicum of supply regularly maintained and renewed. The urban population stood particularly in need of such relief, as without it, the town-worker, more essential than ever because of the urgent demands of the War, would be left to starve; and that would lead to food riots or civic disturbances, which, in turn, would naturally impede the war effort.

The distinction between urban and rural population for purposes of proper rationing, as also the statutory and non-statutory compulsory rationing, was necessitated by the exigencies of administrative machinery, and because there was only a limited food supply. The new machinery had to be developed and elaborated more and more in the years that followed. It necessarily involved the minute arrangement for obtaining or procuring the surplus grain produced by the farmer. For that purpose mere increase in prices was not enough, even assuming against all known facts that the masses of town dwellers could pay the steadily rocketing prices.

Other devices, like a compulsory levy in kind, or an elaborate system of procurement, which could mobilise and

collect in one stock-pile at stated centres all the available surplus, had to be introduced. Specially authorised ration shops were also established in important centres to permit of the rationed grain distribution being more easily effected. At the same time larger organisations, whether of industry or trade, were encouraged to set up and maintain their own grain shops for the benefit of their workers. Voluntary co-operative societies were to be given similar facilities, so as to enable them to distribute the available food supply to their members on an assured basis and at controlled prices.

In the aggregate, however, the total food supply of the country remained a deficit even on a very much smaller ration than was deemed adequate for maintaining working efficiency of the adult and the health of the child population in the country by experts like Sir John Russel, Dr. Ackroyd, or Sir John Orr determining the League of Nations Standard Dietary. The Ration had to be reduced. Against a decent ration of 22 ozs. per head of various items mentioned above, which was deemed barely sufficient to provide adequate nutrition, vitamin and calorific value necessary to maintain working efficiency, it was from the start restricted to 1 lb. per head, and subsequently cut down to 12 ozs. if not lower in many important centres. Even so the deficit remained, partly because of the inevitable peasant tendency in times of rising prices to hoard his produce, and keep away the grain from the market; and partly also because of the operations of the Black Marketeers who made abundance where there was already plenty, and induced starvation where there was scarcity before. To meet this situation, Government had to import in increasing quantities food stuffs from abroad, and pay heavy subsidies to maintain the control price-level which was deemed reasonable under the circumstances. There were considerable imports ever since the shortage began to manifest itself. Figures for earlier years have been given before. In 1946 the total imports were 2.1 million tons; in 1947 they aggregated 2.3 million tons and in the current year as much as 2.8 million tons are expected to be imported for the Dominion of India. Though this is less than 5 per cent of the total food grown in India itself, the volume of imports continuing even now, is sufficiently large to cause anxiety. Large sums were dissipated in bringing these imported supplies to the country, and



maintaining the entire machinery of price control, subsidies to the farmer, loss on ration shops, sacrifice by transport priorities, cost of procurement and transfer of surplus food to deficit areas, etc. All these tended to increase, not only the army of officials required to administer the distribution, but inexorably led to a large degree of corruption which prevailed in all parts.

It was the presence of this corruption, the hardship of the worker, the insufficiency of the ration, and other allied evils, which led the most sympathetic National Leader, Mahatma Gandhi, to work for de-control towards the end of 1947, that is to say more than two years after the war and the emergency created by it had ended. Before embarking on a policy of frank decontrol, Government appointed a Food Grains Policy Committee, which presented an Interim Report in November 1947, and a Final Report in March 1948. These Reports suggested, with some dissenting voices, a progressive de-control of all food stuffs beginning with sugar. In the 8 months, however, which have passed since the policy of decontrol was accepted, that policy has not met with unqualified success.

Other remedial measures thought of at the time by the then Government for meeting the food crisis, was a general overhaul of the administrative machinery as a whole and readjustment of the relations between the Provinces and the Centre. Given Provincial Autonomy which was already functioning; and given the obligation of the Local Government to meet first the needs of their own Provinces, and in face of the havoc such as was wrought in Bengal by the famine of 1942-43, it was inevitable that there should be friction between the Provinces and the Centre, between the States and Provinces inter se, in collecting and distributing the available food supplies of the country in order to maintain a reasonably decent level of nutrition for the mass of people in all parts of the land. Measures devised to facilitate collection from surplus units and allocating and transporting them to deficit areas, enabled Government to meet the emergency for the time being. The system of Inter-Provincial Conference of Departmental heads or, Ministers since 1946 responsible for food supply, has resulted in a fairly satisfactory mechanism for collection and distribution being worked out, which, however, cannot be dispensed with even after the policy as a whole was resolved to be radically modified.

The Interim Report of that Committee recommended, by a majority, that all commitments of Provincial Governments, under the policy of Rationing and Controlled Distribution of food grains be reduced as soon as possible. Those rationing commitments were to be first discontinued which were accepted in recent years, while those accepted in earlier years must be reduced in the reverse order in time. The basis of reducing such commitments must be decided with reference to local conditions, with the definite aim of liquidating Government Commitments as early as possible. Three members of the Committee were against any relaxation of control over food grains during 1948. They thought control could fairly be relaxed only after supplies sufficient to honour all commitments on a 12 oz. ration basis, for all parts of the country throughout the year had been assured and a margin for emergencies provided.

The Committee held, also by a majority, the view that an increase of the procurement prices for controlled food grains was necessary. The amount, however, of the increase to be allowed in different parts must be settled in accordance with the principles and procedure indicated by the Committee themselves. They left it to the Provincial Governments to suggest to the Centre whether any increase, and if so what, was considered necessary, together with a statement of the circumstances which necessitated that increase. The maximum increase a Provincial Government could propose was limited to Rs. 2/- per maund. The Provincial Governments must also indicate if any part of the increased cost would be recoverable from the consumer, as well as the net cost which would not be so recoverable. The Centre should approve such suggestions, after satisfying itself that the increase proposed was not excessive under the circumstances; and that it did not involve unduly wide difference with the procurement prices in adjoining areas. Before passing on any part of the increased price to the consumer, the Central and Provincial Governments must be satisfied that the proposed increase would not raise the price to the consumer to an unduly high level. The net increase in cost should be shared equally between the Centre and the Provincial Government concerned.

Here also 3 members of the Committee dissented, not on any ground of principle, but on the maximum rise in

procurement price, which they would restrict to Rs. 1|8|- per maund of rice, Re. 1|-|- per maund of paddy; and As. 0|12|- per maund of other controlled grain. They would also place the entire net burden of this increase on the Provincial Government concerned. They would, however, compensate the Provincial Government by making the Centre pay a Food Bonus to every Provincial Government, assessed at the rate of 8 as. per maund of controlled food grain procured, plus another 8 as. per maund of controlled food grain exported. The grant of this Food Bonus was to be subject to the condition that it should be utilised exclusively for financing Provincial Schemes for the procurement and distribution at concessional prices to foodgrain producers, of manures, fertilisers and other commodities essential for the production of food-grains.

Regarding Imports from abroad, and basic plan, the Committee recommended to the Central Government :—

- (i) That a ceiling be fixed for foreign imports during 1948,
- (ii) That the Central Government should announce its decision on policy to terminate its dependence on imports at the earliest possible date.
- (iii) Further, out of the quantities actually imported from abroad, not less than a specified quantity must be retained by the Centre Government as an Emergency Reserve.
- (iv) The Central Government must also determine, in agreement with Governments of surplus Provinces and States, a "Basic Export Quota" for each of those Provinces. The Provincial (or State) Government concerned must be responsible for procuring and making available this "Basic Export Quota" during 1948. They must also endeavour to make available as much grain as possible in the form of "Supplementary Export Quotas".
- (v) After consultation with Government of deficit Provinces and States, the Central Government must determine the "Ceiling Import Quotas" to be made available to each during 1948. These "Ceiling Import Quota" will not be exceeded during 1948. The Government of the deficit Provinces or States concerned must be responsible for manag-

ing its food affairs, without making larger demands on the Centre, and to endeavour to reduce its requirements from the Centre as much as possible.

Conclusions reached by 3 Members,—Agree.

The imports ceiling as well as the reserve thought necessary was communicated confidentially to the Ministry of Food.

The three dissenting Members, preferred a slightly higher imports ceiling which was also communicated confidentially to the Ministry of Food

The “Basic Export Quotas” and “Ceiling Import Quotas” were fixed as follows.—

Basic Export Quotas.	Figures in thousands of tons.	Ceiling Import Quotas	Figures in thousand of Tons.
		Bihar	0
Coorg	12	West Bengal	150
		Madras	150
Assam	50	Bombay	350
		Central Provinces	50
Central Provinces	150	United Provinces	0
		Delhi	120
Orissa	150	Miscellaneous Areas	100
		Defence Services	80
Indian States	120	East Punjab	100
		Indian States	400
	<hr/>		<hr/>
	482		1,500
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The dissenting Members would not recommend any particular set of figures at this stage. They could be settled on a basis equitable between different deficit areas only

after discussion with the representatives of the areas concerned.

The following food grains should continue to be subject to controls, viz:

- (i) Rice (including paddy)
- (ii) Wheat (including atta and flour)
- (iii) Millets (including jowar, bajra, and any other millet at present procured and distributed in rationed areas).
- (iv) Maize.
- (v) Barley should also come in this list according to the dissenting trio.

Whether or not controls should be retained in respect of gram to be considered further later.

The Committee recommended that all controls be removed and complete free trade established in respect of all cereals except those mentioned above and all pulses other than gram.

In order to secure supplies necessary for meeting Government commitments, within the Province (reduced in the manner recommended, already) and in order to meet the requirements for export from surplus Provinces, freedom should be given to individual Provinces to use the method of compulsory levy, or monopoly purchase in selected districts, or a combination of both. Details regarding the assessment and collection of the levy as also the operation of monopoly purchase should be settled by Provincial Governments, with reference to these commitments and other relevant local conditions.

All grain traders, and those grain growers holding stocks exceeding 50 maunds of controlled foodgrains must be licensed. They must submit regular returns of stocks, and observe anti-hoarding restrictions.

The control of movements across Provincial boundaries should remain. Restrictions on the movement of foodgrains within the Province should generally be removed, excepting where the Provincial Governments think necessary to enable them to complete their purchases.

All price controls should be removed, except as regards the liability to deliver grain on a monopoly or a compulsory levy basis, at a fixed price.

A sufficiently high priority should be allowed on railways, to be allotted for transport of food grains on private account. This quantity would be increased through complete decontrol of certain grains, and the reduction of Government commitments in respect of controlled food-grains.

Three members dissented on the removal of price control in regard to relaxation of existing controls during 1948. In so far as the majority proposals require new systems of control during 1948, they felt there was insufficient time for necessary administrative preparations, so far as Khariff grains are concerned. They would not advise any material change in the system of procurement during the middle of a crop year.

**Supplemental Foodstuffs.** It was suggested that meat-eaters should surrender some part of their cereal ration corresponding to the quantity of meat purchased by them, so as to secure greater equality among consumers, and save cereals.

As for other supplemental foods e.g. groundnuts, bananas, sweet potatoes, carrots, and turnips, they should be made available at reasonable prices, in such a manner as to bring about a reduction of cereal offtakes.

The Final Report of that Committee dealt more particularly with the permanent aspect of the country's food problem. They considered that the Grow-More-Food-Campaign had not been successful to the extent expected, as it lacked drive and vigour. Besides, the artificial restriction of the area under commercial crops, like cotton or jute, had not led to a corresponding increase of the area under food crops. To avoid such mischances a definite policy must be formulated after full consultation between the Central and Unit Governments. The entire policy and machinery of administration relating to Food Production need radical change.

The Committee felt that the Food Economy in India was exposed to a number of serious risks. The total average food production was deficient in comparison with the total requirements of the country. And production, such

as it was, was likewise, subject to frequent and considerable variations, because of the vagaries of the monsoons. Certain areas were chronically in deficit; and the surplus of others was not a certainty. The cumulative effect of all these factors cannot be expressed with statistical exactness. But, taking all relevant considerations into account, the Committee held that the country should set itself the goal of increasing foodgrains production by 10 million tons annually within the shortest time.

A survey of the potential resources reveals that there is considerable scope for development of multi-purpose river-training and irrigation projects; rehabilitation of famine tracts, intensive cultivation of areas already cultivated through better supply of irrigation, manure, and seed; and extensive cultivation by bringing under the plough a portion of the cultivated waste lands of all types by rapid survey and development of selected and suitable blocks of such lands.

The Committee were clear that, notwithstanding these potentialities, they were not mobilised and developed as they might have been in the past. An all sided effort must now be made to develop these resources with the help of a clear cut programme of such development, fully aided by the necessary funds and administrative organisation.

The development of Agriculture, in the Committee's view, must remain a Provincial responsibility. But the Centre must coordinate the individual plans of the units, and make them into an integrated National Plan. It must also procure and allocate essential supplies to the units required to carry out their plans. The reclamation of cultivable waste land should likewise be a Central responsibility. The Provinces and States must shoulder the task of developing minor irrigation works in their jurisdiction, like wells; they must develop local manurial resources like green manure and compost, and distribute improved seed varieties.

The success of these recommendations would depend on a suitable administrative organisation, in which village cooperative societies must play an important role. The Committee recommended:—

- (a) The establishment of a Central Board of Agricultural Planning to coordinate food production plans, to determine priorities and allocate sup-

plies, and to examine and approve plans for their reclamation of cultivable waste lands.

- (b) The setting up of Provincial Boards of Agriculture to advise the Central Board and the Provincial Governments, and to assist the Central Land Reclamation Organisation.
- (c) The setting up of an autonomous Central Land Reclamation Organisation, with a capital of Rs. 50 crores to be given by the Central Government, with a full time Board of Directors to undertake the planning and execution of the land reclamation projects.



## **Government's Decision On The Report Of The Food Grains Policy Committee**

The latest official declaration of the policy of Government in regard to Food Crops was made in the Constituent Assembly (Legislative) of India, in April 1948. After giving careful consideration to the interim recommendations, the Government of India generally accepted them, and announced their revised policy accordingly. They had agreed to fix a definite ceiling on total imports from overseas during 1948, exclusive of the carry over from the foodgrains purchased during 1947.

They had also prescribed specific export surpluses from certain areas, and specific central allocations to some deficit areas within India. The Provinces had been allowed to raise the procurement price of wheat and rice, to decide whether to maintain control or to decontrol prices of other grains, and the statutory control over maximum wholesale prices. The method and the manner of producing their internal crops were also left to the units. They were asked to limit Government commitments in respect of rationing in the light of resources available to the Provinces, with the definite objective of facilitating gradual abolition of rationing and control.

The Dominion Government had also to decide about:—

- (i) the total ceiling on imports during 1948,
- (ii) the fixation of ceiling export and import quotas for surplus and deficit areas in India, and
- (iii) the earmarking of a definite quantity for Central reserve purposes.

After careful consideration of import prospects and the impact of such imports on the foreign exchange position, Government decided that the effective imports from over-seas during 1948, should be limited to 2 million tons. At the beginning of 1948, Government's total resources were estimated at about 2.9 million tons made up as follows:—

	(in thousand tons)
(1) Carry over from 1947 ..	500
(2) Imports during 1948 ..	2,000
(3) Internal surplus based on ceiling export quotas ..	400
	<hr/>
Total Resources ..	2,900
	<hr/>

As against these resources, the aggregate central allocations to deficit areas during 1948 were estimated at 2,200 thousand tons. The balance of 700 thousand tons was meant to build up a central reserve. These estimates were made at the end of 1947; but had to be revised considerably in the light of subsequent developments.

Most deficit areas with the exception of Travancore, Cochin, and Mysore, had cut down their rationing commitments, reducing the number of rationed centres and derationing all others.

Most deficit areas also gave up the compulsory levy procurement. Bombay gave up even the monopoly of procurement. They raised the price of rice to the producer by approximately Rs. 2. Some of them like Bombay and Madras removed statutory control over maximum wholesale prices. The surplus areas abolished rationing, and compulsory procurement. They bought in the open market the necessary quantities to meet their export quotas.

### **Overall Crop Position during 1948.**

At the time the new food policy was adopted and announced, there was a general expectation of good kharif crops of rice, millets and maize in all areas. The harvesting of these crops commenced about the end of 1947. Subsequent information now available shows that the anticipation about good rice, millets and maize,—crops is not likely to be realised in many areas of the country.

### **Imports.**

The Government of India decided to limit the effective imports during 1948 to 2 million tons. Notwithstanding strenuous efforts, India could not get an import quantity larger than 2 to 2½ million tons during 1946 and 1947, owing to the world food shortage. To secure 2 million

tons is by itself a difficult task depending on the world availabilities. There are certain relieving features about our import position during 1948 as compared to 1947 and 1946, when India needed much more than 2 million tons. In these two years the effective quantities of Imports for India was a matter of negotiations and efforts from month to month; and at no time had the Ministry of Food any assurance about the effective imports for the year. As against this, India started 1948 with at least assured 12 lakh tons. Under the wheat deal with her, Australia has promised to supply 25 million bushels or approximately 7 lakh tons during 1948. We also secured an allocation of 4 lakh tons of rice under the I.E.F.C. from specified sources for January—June 1948, but have yet to make all possible efforts to obtain the balance of 8 lakh tons to reach the target of 2 million tons. If the supply position in India deteriorates and further imports are necessary, and if the prospects of obtaining such additional imports are favourable, Government would certainly consider purchasing the additional quantities.

### **Internal Procurement.**

The deficit Provinces and States have retained the system of monopoly procurement in their surplus areas. It must, however, be recognised that the target of procurement, which these deficit areas have set before them, will be found to be difficult of realisation, as the general anticipation that Government's declared policy is to abolish controls at the end of the year is likely to lead to hoarding by producers and render procurement difficult. To encourage procurement the Central Government have promised to pay a bonus of annas -8/- per maund on all foodgrains procured by the Provinces; and a further bonus of annas -8/- will be payable on all quantities of foodgrains exported by surplus provinces to deficit areas.

In accordance with the principal recommended by the Foodgrains Policy Committee, the Government of India have fixed export quotas for surplus areas and import quotas for deficit areas. The export quota represents the quantity of foodgrains which the surplus areas concerned should endeavour to export to other deficit areas during 1948. The import quota represents the assistance which can be relied upon by the deficit areas from the Central Government.

With the separation of West Punjab, Sind and Bhawalpur from the Dominion of India, there is practically no wheat surplus area in India. The total internal surpluses were estimated to amount to about 4 lakh tons. Making allowance for defaults, the total quantity which can be relied on was taken at about 3 lakh tons.

On this calculation, the grain resources which the Dominion can rely upon were estimated at about 17 lakh tons of imports, plus 3 lakh tons of internal surpluses, total of 20 lakh tons. In addition there are about 5 lakh tons, mostly Argentine maize and barley, expected to be received during 1948. This makes a total of 25 lakh tons which would be increased to 28 lakh tons, if the full import figure of 2 million tons is realised.

Out of these resources the Central Government distributed 22 lakh tons to deficit provinces and States. Most of these deficit areas have represented to the Centre that the Central allocations made to them are inadequate.

The Madras Government had represented that the province was threatened with a grave crisis between May and October, 1948, owing to the total failure of the North-east monsoon. Their rice crop and millet crop were estimated at 37 lakh tons and 19 lakh tons, which are the lowest on record in the last 10 years. They estimated their deficit at 2 million tons, and asked for the maximum assistance from the Centre,—in any case an allocation of at least 6 lakh tons. The Central Government promised to raise Madras allocations to 4 lakh tons, and to accelerate supplies in the earlier months.

The West Bengal Government have represented that their procurement target of 5 lakh tons of rice was not likely to be reached. Their total commitments would be about 8 lakh tons; against which the resources will be about 7 lakh tons, consisting of 2 lakh tons of central allocation and 5 lakh tons of internal procurement leaving a deficit of one lakh tons.

The Central Government were confronted with certain additional important demands upon the resources at their disposal e.g. that of the refugee camps, estimated to add a further burden of about one lakh tons during 1948.

Since controls were instituted, it was the policy of the Central and the Provincial and State Governments to regard

supply to the essential workers such as railway workers, dock workers, industrial labour, colliery workers, and so on as the first priority on the available supplies. The Railway Workers alone demanded some 4½ lakh tons. The Provinces and States were asked to supply this demand out of the resources made available to them. After the Provinces and States had reduced their commitments and abolished rationing in many areas, there was some apprehension by essential services' workers that their supply would be costly and uncertain.

It may be mentioned that the system of rationing and food control in India started in the first instance with attempts to cater for (a) the army (b) essential workers in railways and industries. As it became difficult to demarcate between essential and non-essential workers, it was increasingly realised that the best solution would be to have full-fledged rationing systems. When rationing was to be discontinued the problem of meeting the demand of workers in derationed areas was bound to crop up. Under the latest declaration of Government policy, the workers, in common with other consumers, will have to obtain the requirements from the open market.

### **Revised Estimate of Resources and Requirements.**

The latest review of the demands of the Provinces being of an extraordinary nature it shows that the Central Government may have to allocate an additional quantity of about 5 to 6 lakh tons over and above the 22 lakh tons which they have originally distributed. On this basis the total commitments were estimated at 27 or 28 lakh tons. Against this the resources, even if India were to secure an effective quantity of 2 million tons, will be 28 lakh tons. "It has been stipulated as an integral part of the new Food Policy that the Centre should try to build up a reserve of at least ½ lakh tons during 1948. The Government of India have not yet come to any decision regarding additional allocations to meet these increased demands. At the moment, they propose to accelerate despatches to areas where the position is more difficult than others. But if they were to meet the extra demands, it will be practically impossible to build up a central reserve and it may even be necessary to make every possible effort to obtain additional imports."

## Prices

The Government of India have kept watch on the price trends since the implementation of the new policy in December 1947. Reports about prices show that in many areas the prices of wheat and millet have increased by 100 per cent over the control prices. A comparison of the current prices with the prices, which prevailed in the free or Black Market before the modifications of controls showed that the prices in March 1948 were lower than the Black Market prices. Since, then, however, prices have been rising once again, though a comparison is not possible, as the Black Market price is always varying.

In judging the present price trends two important facts must be noted. So far as rice, millets and maize are concerned, January-June is the peak period of the harvesting of 1947 crops. For that generally, the market and price conditions tend to be easy in these months; while they stiffen as between June and October. Secondly, even when full-fledged controls were in force Black Markets did exist. A large majority of the population, particularly the industrial workers, were, however, insulated from the Black Market prices by the availability of supplies at controlled prices under the rationing or distribution schemes. With the abolition of these schemes, in large deficit areas a large number of people will be thrown on the open market, who will have to buy grain at competitive prices.

## Sugar, Gur & Oilseeds

In common with the controls over the basic foodgrains, Government had maintained control over the prices and movement of sugar and gur. This was removed in December 1947. The Indian Sugar Syndicate, controlling distribution of 80 per cent of the sugar produced in India, agreed to sell that sugar at Rs. 35 per maund, which meant an increase of nearly 67 per cent on the control price at Rs. 21. After decontrol, supplies were said to be available at about Re. 1 a seer for sugar and between annas -14/- to -16/- for gur. This meant a rise of nearly 100 per cent in open market and a present of crores upon crores to the sugar industry. The controlled distribution of sugar was comparatively a more difficult task than the controlled distribution of food-grains, as sugar was more or less a luxury article, and its consumption was confined to comparatively a smaller population. The policy

of decontrol of sugar and gur has undoubtedly led to sharp reduction in the gur prices. That may reduce demand for sugar, which will in any case be small when sugar sells at Re. 1|- a seer as against as -|10|- a seer.

One of the essential corollaries of the comprehensive system of food control was the Central control and direction of the movements of foodgrains by rail and by sea, the main bottleneck responsible for many difficulties. To assist the policy of partial decontrol, Government have given high priority to the movement of foodgrains, sugar and gur, according to the availability of wagons. The existence of high priority for controlled foodgrains as between Provinces, side by side, with uncontrolled and unco-ordinated movements of foodgrains by Trade within the Provinces, however, increased the Railways difficulties in dealing with the position.

The conclusions Government drew from this analysis were :—

- (i) The over-all supply position has changed materially since Government formulated and announced the revised Food Policy.
- (ii) The Madras Province was faced with a serious failure of the paddy and the millets crops. The position in this Province is likely to become very difficult between May and September. In West Bengal and some parts of Bombay it may also tend to be difficult. Elsewhere it has not shown any appreciable deterioration.
- (iii) Quite irrespective of the Government's decision as a matter of policy to limit foodgrain imports to 2 million tons, it is unlikely that India would be able to secure more than 2 to 2½ million tons of foodgrain imports from outside in view of the World Food Shortage. Reliance must be placed upon internal measures in the field of procurement and distribution to meet the situation that might arise in Provinces like Madras and West Bengal.
- (iv) The assistance, which the Centre could give to these Provinces would necessarily be limited, and these areas must devise ways and means to step up their procurement, and also to protect the

poorer sections of the population in the event of the situation taking a turn for the worse from May onwards.

- (v) If additional allocation has to be given to some of the Provinces, which are adversely affected, it would not be possible to build up a Central Reserve. Government do not contemplate any reversal of their revised Food Policy. The public, however, must be fully apprised of the changed supply position as Government's efforts to tide over the situation can only succeed provided full public co-operation is forthcoming.

This policy, it must be pointed out, is calculated to meet the immediate emergency, and not as a permanent solution of our food problem. The suggestions made by the Foodgrains Policy Committee, and others, also, discussed earlier in these pages, are aimed both at an immediate solution to meet our food shortage even if it lasts for 5 years, and also as a long-term permanent solution, with a view to attain the principal objective of the National Planning Committee, viz. self-sufficiency in all essential requirements.



## CHAPTER VII.

### Cash Crops.

The principal commercial, or cash crops, which are mostly raw materials for manufacturing industries, are :— cotton, jute, tea, coffee, tobacco, sugar, opium, cinchona and other drugs; and spices. They are called “cash crops” because they are raised primarily for sale, as against immediate consumption by the producer himself in any considerable degree. The necessity for sale is forced upon the producer, not only because of the impossibility of himself consuming the crop raised on his holding, but also because the Land Revenue demand of Government being fixed in cash, the produce which lends itself most easily to be converted in money becomes most acceptable and economically advantageous to the cultivator.

These crops figure largely in India's exports also. In value as well as in quantity, they account for more than three-fourths of our total exports. Other crops, like Oil-seeds, also figure on the export side, though they too have a food value. There is a great demand for these products at home also; and so their place in export becomes progressively inconsiderable. Sugar-cane is more particularly raw material for industry, which has made a remarkable progress in the last 15 years or so, starting from scratch, so to say, in 1931 and developing till the entire home market is supplied by home grown sugar. For the principal cash crops, also, there is increasing demand at home in the indigenous industries built up in the last two generations. Their export and local consumption are, however, mutually balanced; and so we consider them apart. Exports help to pay for imports, and so if any of these crops is in excess of domestic requirements of direct consumption or industry, there is no reason why such surplus should not be exported.

Because of the immediate convertibility, so to say, of these crops into cash, there has been a noticeable tendency in the past to expand the area under those crops, at the expense of the land available for food crops. Most of the recent improvements, technical developments, or advances in agricultural science and economy, e. g. extension of irrigation; or use of better seed or devices to resist plant disease or destroy pests, benefited these crops much

more directly than the Food Crops. In a scientifically planned economy, however, there must be a balance,—not too rigidly fixed,—between the land, labour and capital devoted to Industrial Raw Materials, and those devoted to Food Crops. The ultimate ideal which will govern both these requirements equally, is the attainment of National Self-sufficiency as much as possible. With that goal in view, the balance will have to be so adjusted that the food materials produced in the country, as well as the principal raw materials of industry would be sufficient, in quality and quantity, to meet the local demand steadily increasing because of expanding industrialisation and improved standard of living.

Under planned economy, moreover, there must be none of those wide fluctuations, from year to year, in the area under an yield of particular crops, which has been the characteristic of India's agrarian economy all these years. Within well defined limits, the area must remain steady for given crops. The yield must be similarly regular and dependable, so that programmes of development can be based satisfactorily upon them. Factors, like variations in rain-fall, which account for a good deal of these fluctuations, must be neutralised, by the remedial, protective, and insuring measures already suggested in the earlier section of this volume, and in other volumes in this Series. World conditions affecting prices or trade should also, be counteracted, wherever they are likely to exercise a disturbing influence. When all such steps have been taken as they must be in a properly planned economy, the balance would not be difficult to fix, nor hard to maintain. There should be no need to resort to such temporary measures as Grow-More-Food Campaigns, or Food crop subsidy in normal times, if the Plan is functioning as it should; and in no case should there be any question of sacrificing cash crops to food crops or vice versa.

It is impossible, in such a work as this, to say categorically how much, or what proportion of, land should in a planned national economy be devoted to food crops, and what to industrial raw materials,—the so-called cash crops. It will be for the National Planning Authority, in accordance with the prescribed procedure, to determine from time to time, the area that should be devoted to Food Crops, and that placed under Cash Crops. To illustrate our main theme, however, we may say, that when the Plan

envisaged in this Series is in full working order, it is probable the Indian Dominion would have something like 300 million acres sown with crops. This allows for culturable waste land brought under cultivation, fallows utilised, and new land reclaimed from marshes or arid tracts by Irrigation and other multi-purpose River-Training Projects now in execution. The area today under Food Crops does not yield sufficient to meet even the very low scale of India's local demand. Even if the unit yield is substantially increased by the adoption of measures indicated elsewhere, but the area remains the same, the improving standard of dietary and living in general may not be satisfied by yield increase from this source. More land must, therefore, be under cultivation, and under a much larger variety of crops.

Of the 300 million acres mentioned above, it would not be asking for an unbalanced economy, if it is suggested that 225 million acres must be under food crops of all kinds,—cereals, pulses, fruits, and vegetables, sugar and fodder, oil-seeds and tobacco, etc.; while the balance devoted to cultivation of raw materials would suffice to meet the needs of intensive industrialisation for the next 10 or 20 years.

Cotton is the most important of the commercial or cash crops, figuring very substantially also on our exports side. India is the second largest producer of Cotton in the world, as shown by the following Statistics :—

### World's Cotton Crops \*

(Figures are in thousand bales of 478 lbs. each.)

Countries.	1938-39	1944-45	1945-46	1946-47.
U.S.A.	11,676	11,900	8,655	8,526
Brazil	1,913	1,600	1,350	1,300
Russia	3,800	2,500	2,200	2,600
India	4,531	3,180	3,300	3,400
China	1,067	800	600	500
Egypt	1,756	960	1,080	1,210
Total :—	27,739	24,044	20,015	20,277

\* Source :—Bombay Cotton Annual, 1946-47, No. 28. P. 154.

The acreage and yield of Cotton in India are shown below :—

### Acreage and Production of Cotton in India.

Year.	Area All India. (million acres)	Production All India. (Estimates) In thousand bales of 400 lbs. each.
1911-12		3,288
1916-17		4,492
1921-22	16.3	4,484
1926-27	21.9	5,024
1931-32	20.9	4,007
1936-37	22.0	6,234
1937-38	22.8	5,722
1938-39	23.4	5,051
1939-40	21.5	4,909
1940-41	23.3	6,080
1941-42	24.1	6,223

	Indian Union	Paki- stan.	Hyde- rabad.	Total.	Indian Union	Paki- stan.	Hyde- rabad.	Total
1942-43	13.1	3.1	2.9	19.1	2,598	1,616	488	4,702
1943-44	13.3	3.6	4.1	21.0	3,061	1,633	565	5,259
1944-45	9.4	3.4	1.9	14.7	1,920	1,407	253	3,580
1945-46	9.1	3.3	2.1	14.5	1,858	1,411	261	3,530
1946-47	—	—	—	14.8	—	—	—	3,566

Source : **Acreage**—1911-12 to 1937-38 from the Technological Possibilities of Agricultural Development by W. Burns (1944).

1938-39 to 1941-42 and 1946-47 from Bombay Cotton Annual 1946-47 No. 28. P. 34, and p. 33 respectively.

**Yield**—1911-12 to 1941-42 and 1946-47 from Bombay Cotton Annual No. 28. P. 45-46.

**Acreage and Yield**—1942-43 to 1945-46 from Estimates of Area and Yield of Principal Crops in India 1936-46. Issued by the Economic and Statistical Adviser. (1948).

The figures are not strictly comparable if we take All India, or British India. The latest figures however are analysed into several parts of the country, and given separately, as well as in the total. They vary considerably from year to year both as regards acreage and yield. The average area under cotton in the five years ending 1938-39 was 24.6 million acres for all India, and the average yield 5.5 million bales of 400 lbs. each. In the next quinquennium the average annual acreage declined to 21.9 million acres, and the yield was reduced to 5.4 million bales. In 1944-45 the area fell still further to 14.8 million acres, but from this the yield was 5.4 million bales. Under the latest figures, the acreage is shown at 14.86 million and the yield at 3,566,000 bales (1946-47). This was partly due to improved seed variety which accounted for more than half the total acreage under Cotton. The fall in acreage is very much more severe in the Dominion of India than in Pakistan. The yield per acre is also much poorer in the former than in the latter.

**Cotton—Yield per acre.\* (In lbs.)**

	Indian Provinces	Pakistan Provinces	Hyderabad
1942-43	78	208	66
1943-44	88	180	55
1944-45	82	169	52
1945-46	81	169	48

\* Source—Estimates of Area and Yield of Principal Crops in India 1936-46. Issued by the Economic and Statistical Adviser. (1948).

These variations in the acreage and yield of Cotton are due to a number of circumstances and conditions which have hitherto made such fluctuations inevitable. The most important of these factors is, as in the case of the other crops, the character of the season. This varies from year to year, and so makes it inevitable for the cultivator to adjust his area under cotton. Another factor working in the same direction is the price-level. Cotton is a principal article of international commerce and as such the rice factor in the world market has a decisive bearing on the acreage and crop raised in the country. There are more considerable producers—or of better quality who compete with the Indian cotton in our own and in the world market. With the ups and downs of international relations; with any threat of war, or any prolonged Depression in other countries, the cotton cultivator in India seems to have almost automatically responded by reducing his acreage or yield whenever the world price parity declined or some definite impediment to foreign trade occurred. Exchange vagaries in the generation after World War 1, and intense economic nationalism particularly in the more backward countries caused impediments or barriers in the way of international trade which also affected the acreage and volume of cotton produced.

On the other hand, there has been indeed a growing consumption within the country itself as is indicated by the following table:—

**Progress of Cotton Mills in British India and Indian States.**

Year ending 30th June.	No. of Mills.	No. of Spindles.	No. of Looms.	Approximate Quantity of Cotton. Total Consumed.**
1913	272	65,96,862	94,136	20,96,016
1918	262	66,53,871	1,16,484	20,85,678
1923	336	79,27,938	1,44,794	21,51,698
1928	335	87,04,172	1,66,532	20,09,782
1932	339	95,06,083	1,86,341	29,11,264
1937*	370	97,30,798	1,97,810	31,46,752
1938*	380	1,00,20,275	2,00,284	36,62,648
1939*	389	1,00,59,370	2,02,464	38,10,734
1940*	388	1,00,05,705	2,00,076	36,79,874
1941*	390	99,61,178	1,98,574	42,51,022
1942*	396	1,00,26,425	2,00,170	47,40,722
1943*	401	1,01,30,568	2,00,890	48,90,218
1944*	407	1,02,22,107	2,01,761	48,44,564
1945	417	1,02,38,131	2,02,388	49,09,314

Source : p. 740, Indian Year Book 1947.

\* Excludes Burma and Ceylon.

\*\* Bales of 392 lbs.

The whole of this consumption by the Indian Mills, in addition to the consumption by the Hand Loom Industry, does not represent the totality of the Indian Crop as the finer counts in the Indian mills are made from imported cotton. The following figures indicate the mills' consumption of Indian cotton as well as of Foreign cotton—all varieties:—

**Consumption of Indian Cotton  
in Indian Mills.****Consumption of Foreign  
Cotton in Indian Mills.**

(Pressed and Unpressed cotton)  
(Excluded Pakistan from 15th  
of August, 1947)

Year end- ing 31 Aug.	Total (bales of 400 lbs. each)	Year end- ing 31 Aug.	Total (bales of 392 lbs. each)
1923-24	1,835,943		
1927-28	1,771,349		
1931-32	2,346,396		
1936-37	2,632,785		
1937-38	2,999,609		
1938-39	3,151,065		580,164
1939-40	3,050,106		539,266
1940-41	3,617,147		571,222
1941-42	4,025,395		635,140
1942-43	4,306,831		568,170
1943-44	4,119,461		664,468
1944-45	4,158,664		685,212
1945-46	3,871,022		590,356
1946-47	3,150,852		730,656

\* Source—Bombay Cotton Annual, 1946-47, No. 28.  
P. 84—85.

The Indian Hand-loom Industry consumes principally Indian Cotton only, though higher count yarn made by mills out of imported cotton is not unknown. That consumption approximately amounts to 1,000,000 bales a year. India is thus both an importer and exporter of cotton, as the following table shows.



**Annual Export of Raw Cotton from India.****Year Ending 31st March. (In thousand bales of 400 lbs.)**

Year	Total	Year	Total.
1932-33	2,063	1940-41	2,168
1933-34	2,729	1941-42	1,438
1934-35	3,490	1942-43	301
1935-36	3,397	1943-44	282
1936-37	4,268	1944-45	319
1937-38	2,732	1945-46	761
1938-39	2,703	1946-47	911
1939-40	2,948		

Source :— Bombay Cotton Annual, 1946-47, No. 28.  
 p. 80 Figures prior to 1937-38 include  
 Burma.

Between a third to half of our total raw cotton used to be exported. These exports were principally to Japan and some European countries, like Italy, Czechoslovakia, etc.

On the whole, the tendency is to a decline in the exports of Indian cotton to foreign countries, mainly because of the progress of the Local Textile Industry. That Industry does not depend solely upon indigenous cotton, but imports some 12½ per cent. of the superior quality from America, Egypt, Uganda or East Africa. The growth of the Handloom Industry, by special protection, so to say, has also led to an increased consumption of home grown material. The decline in exports appears very heavy in the last five years but that is no indication of the true position, as those were years dominated by the War, and all the dislocation and difficulties caused thereby. The objective of maximum industrialisation, under carefully planned economy, would require the whole of the home grown material to be first utilised in the local industry. Recourse

should be had to foreign imports only when the domestic material did not suffice to keep the local manufacturer fully fed. Per contra, there should be every discouragement to exports of indigenous material when the domestic industry feels itself short of such raw material, provided that expansion of the local industry is deemed necessary to meet the optimum of local demand under a scientifically planned national economy. If the local industry desires to improve the quality of its produce, and the raw material available in the country is not suitable for the purpose, foreign imports may be permitted. But if there is room to grow similar quality of such material within the country,—(it may be difficult to achieve this after the Partition of the country),—every endeavour should be made to grow better quality material within the country itself.

It is unnecessary to go into the problems of the Cotton Textile Industry any further in this place. The room for its maximum development, and coordination with the optimum demand for clothing under planned economy is considered a little more fully later on.

The exports are chiefly of short staple and the imports are of long staple though attempts have been made to grow long staple cotton in the irrigated areas of the Punjab and Sind. The best irrigated tracts give a normal yield of about 200 lbs. of ginned cotton per acre, though yields even higher than this have been recorded. On the other hand, in the un-irrigated tracts, 60 lbs. per acre is considered a good crop. In Sind and the Punjab the yield is much higher as shown by the foregoing table. In recent times as a result of the work of the Agricultural Department and the Indian Central Cotton Committee, the quality and yield per acre of staple cottons have improved considerably.

External factors as the long depression of the early 30's all over the world, which brought down the price of all agricultural produce as well as of cotton to a very low record, also exert their influence in reducing the acreage as well as the total quantity produced. On the other hand, local factors like the 'Grow-More-Food Campaign' during and since the War go very far to bring about a decline in the production of Cotton. The considerable shrinkage in

the area under cotton is, no doubt, due to this factor. Not all the area, however, taken from the cotton crop, was added to food crops. Such success, in fact, as the Grow-More-Food Campaign attained was due in no small measure to a practical disappearance of the export markets in Japan and elsewhere because of the War and the shortage of shipping space available, because of the same reason. In a properly planned economy, such excessive emphasis on one sector of the National Economy as against another, cannot be permitted—except under sudden emergency. It must, therefore, be no small part of the work of the National Planning Authority to determine the area to be assigned to such commercial or industrial crops and that to Food crops.

The progress of the Indian Textile (Cotton Mills) Industry and the fiscal protection granted to it, stimulated production of raw cotton which, however, suffers whenever the total area under this crop gets a set back. The highest figure of acreage was reached in 1925-26, when the area under Cotton cultivation was 28.4 million acres, and the yield was 6.2 million bales. The latter has since been exceeded. The price has varied from Rs. 346 per khandy in 1928-29 to as low as Rs. 188 in 1930-31, and has even touched Rs. 900 during the World War I, and immediately thereafter. In recent years had rigid control not been imposed on the ceiling price of cotton, the price would have risen much higher. The control, it has been urged in some quarters, has fixed an Indian price far below the world parity. Otherwise the price rise would have been much greater.

There is a large variety of cotton cultivated in India. It is spread over almost every unit in the country; there is nothing like a cotton belt. An analysis of the Cotton Crop of 1940-41, given by Dr. Burns in his *Technological Possibilities of Agricultural Development in India*, lists six principal varieties graded according to the length of the staple. That list, annexed, shows that of Cotton above  $1\frac{1}{2}$  inch India produces hardly any quantity, of that above 1.1|16 inch the production is very small and uncertain; but of that up to 1 inch, in the last year before the War, there was not only enough for all Indian Mills but also an exportable surplus.

**Indian Cotton classified according to Staple Length.**

Classification.	Bales of 400 lbs. each. Govt. official forecast.
Long staple—over 1 inch, Punjab-American 289F (including 289F K25) and Cambodia Co3 and Co4 ..	108,000
Medium staple A-1 inch (including Punjab-American 289F 43m Sind Sudhar, 289F1, part of 1027 ALF and part of Camodia Co2) ..	249,000
Medium staple B-7 8 to 31 32 inch (including part 1027 ALF, part Cambodia, Jaywant, Punjab-American LSS, 4F, Jarila, etc.) ..	1,888,00
Short staple A-11 16 to 27 32 inch (including Salems, Dharwar-Upland, C.P. No 1, Oomras, Hyderabad, Kumpta, Upland, Banilla, etc.) ..	1,106,000
Short staple B-9 16 to 21 32 inch (including C. P. Nos. 2 & 3 Oomras, Khandesh Oomras, Barsi and Nagar Oomras, Dhol-leras, etc.) ..	1,425,000
Short staple C-17 32 inch and below including Bengals from the United Provinces, Rajputana, Sind and the Punjab, also Comillas. ..	1,305,000
Total: ..	<hr/> 6,081,000 <hr/>

Cp. Cit. p. 82.

"The long-term policy of the Indian Central Cotton Committee and of the Agricultural Departments working in co-operation with it, has been to establish a better balance between short staple and medium staple cottons. Great progress has been made in this direction", says Dr. Burns in his work already mentioned (p. 82). Ever since the Indian Central Cotton Committee commenced work in 1922, the production of medium and long staple cotton has gone up from 1½ million bales in 1922-23 to 2.73 bales in 1942-43. This was consumed both in the local industry,

as well as exported as the figures given in the Table on pp. 146 and 147. Japan and some European countries used to be our principal markets. In the last year before World War II, the reduction in Japanese and European purchases of short staple cotton was so sharp that local consumption had to be increased. A reasonably balanced production was reached as much because of the disappearance of exports, as because of the Grow-More-Food Campaign. Their purchases from Africa, Egypt, and America were entirely governed by price, but the Exchange restrictions have particularly affected the imports from the United States.

What is now required is the production of longer staple under American varieties which are principally grown in Sind and the Punjab. As these Provinces, however, have separated from India, the Indian Union's supply of this quality would be substantially reduced. That part of the Textile Industry, therefore, which consumes such cotton will have to depend upon imports of the requisite quality. The diversity of conditions under which cotton was grown, and the variety of the types, are found reflected in the difference in the average yield of different staples in different Provinces and States, and even in different parts of the same Province or State. The Cotton Forecast Improvement Committee of the Indian Central Cotton Committee has for years been endeavouring to improve cotton statistics. In certain cases it has altered the standard yield of certain areas in order to get the final result as near to the actual as gathered from the baling returns. India's average yield per acre compares very poorly with the standard yield per acre as reported for 1937-38 in the nine leading cotton producing countries given below:—

Egypt	531	United States	264
Peru	508	Brazil	154
A. E. Sudan	277	Uganda	84
Argentina	151	India	89
Soviet Union	322		

Source :— Dr. Burn's Technological Possibilities of Agricultural Development in India.

The best guarantee for improvement in the yield per acre in this crop lies in improved seed variety. As already

stated above, something like 7 million acres or nearly half the present acreage under cotton, are under improved seed variety; and these yield a much higher quantity than was the case before. Besides improved seed, adequate manure with suitable material, and proper rotation of crops as well as suitable cultivation of the heavy soil in which cotton is commonly grown, will also contribute to raise the unit yield substantially specially if the pests and diseases common to the cotton plant are controlled. Researches are being carried out in regard to the latter in all the important cotton growing regions and the results have begun to show themselves. Dr. Burns in his work frequently quoted, summarises as follows the prospects of increased yield in India:—

- (1) improved variety (meaning increase in actual kapas per acre, increase in ginning percentage, resistance to pests and diseases, resistance to tirak),
- (2) utilisation of suitable rotation, so that cotton is not grown after cotton, and comes after a crop which does not depress the yield but increases it,
- (3) the utilisation of manure, both organic and artificial, according to schedules worked out to suit the soil requirements and having reference to the prices of the manure and the value of the produce.

These devices would be more needed than ever after the Partition. The same authority also adds that, in considering the technological possibilities of cotton in India, the use of cotton seed and of cotton fabrics in new ways must be borne in mind. The cotton seed is generally fed to bullocks and milk animals; and as such, it forms an important item of cattle food. The Punjab Agricultural Department has carried out a carefully planned experiment in cattle-feeding, financed by the Indian Central Cotton Committee. The results obtained show that in so far as the quality of the milk, ghee and butter produced from the animals fed on such matter, there was no noteworthy difference.

Cotton seed is also used for oil production though it is not so far attempted on a large scale.

Experiments are being made to discover if Indian cotton can, by chemical treatment, be made suitable for belt-

ing and motor tyre uses. The suitable length required for such purpose is much higher, being 1.3|16" which is not available in India. Special experiments would be needed to find suitable soil and seed for this purpose.

From the point of view of planning food and cash crops, of which latter Cotton, is the most important, adjustment will depend largely upon the improvement in unit yield, and the total need of our industry for attaining the ideal of national self-sufficiency in the matter of clothing. According to the Industrial Panel relating to this Industry appointed by the Government of India 1943, the present production of something like 4,800 million yards of cloth was to be raised to 7,200 million yards per annum.

#### Production of Yarn and Cloth in Indian Mills.

Year ending 31st March	Yarn produced in lbs.	Cloth produced in lbs.      in yards.	
1919-20	635,760,273	383,925,750	1,640,047,774
1922-23	705,893,599	405,253,739	1,725,284,187
1927-28	808,940,373	567,806,045	2,356,564,805
1932-33	1,016,421,864	694,901,057	3,169,898,949
1937-38	1,160,715,937	864,205,041	4,084,276,363
1938-39	1,303,245,902	920,475,805	4,269,269,499
1939-40	1,234,873,374	877,812,094	4,012,529,025
1940-41	1,349,155,791	981,402,688	4,269,475,002
1941-42	1,577,177,579	1,093,358,174	4,493,613,208
1942-43.	1,533,795,865	1,062,057,273	4,109,386,790
1943-44	1,680,417,497	1,192,678,290	4,870,686,903
1944-45	1,650,925,426	1,199,503,697	4,726,472,273
1945-46	1,614,816,846	1,174,604,857	4,675,634,321

Figures prior to 1937-38 include Burma.

Source—Bombay Cotton Annual, 1946-47, No. 28 page 148.

For this purpose the yield of cotton of all varieties must be increased to something like 10 million bales, or the balance that would be needed over and above the local production would have to be imported from abroad. This would necessitate not only imports of the required heavy machinery, but also of so much of the cotton that cannot be produced at home to be made into the increased yardage. This would mean a strain on our dollar resources, which prove unbearable if centred on one commodity or a group of commodities only. There is also the difficulty, almost impossibility, of getting ready or early delivery of machinery, which makes the prospect of an early optimum development of the industry rather remote. Even if the Indian production amounted to 7,200 million yards, it would hardly provide more than 20 yards of clothing per head per annum taking the population of the Dominion of India at 360 million. The standard of reasonably adequate clothing laid down by the National Planning Committee, requires 30 yards per head per annum, which means that even if the mill industry expands as targetted above, it will not provide in five years decent clothing for more than two out of every three citizens of India. That production must, therefore, be supplemented, not by imports of foreign cloth, but by the development of the handloom industry, which will give additional or subsidiary employment to another 10 million souls.

The Hand Loom Industry has been estimated to produce something like 1600 million yards, or one-third of the total mill production today. There may thus be room for further expansion in that industry as well.

This cottage industry has all its tools and implements available at home, so that there would be no need to order any elaborate machinery from abroad, and thereby weaken our exchange position. Its raw material also is accessible to the producer, it is at short range; and of the quality and quantity that the worker is used to. For exploiting these advantages to the utmost what is needed most is a scientific reorganisation of the worker into some kind of a co-operative association, so that all the requirements of that craft,—including an economic marketing of the finished product,—may be properly attended to by well qualified persons.

A recent development in the working of this industry, which deserves special notice, is the introduction of the



small Power Loom. According to the Fact Finding Committee appointed by the Government of India in 1941 there were 11,604 power looms in India, of which about 55 per cent were used in the Bombay Province alone. The latest information puts that number at 18,578 (1946). The Fact Finding Committee, however, discovered that the cost of production of the hand-made cloth was very high, mainly on account of the heavy profit of the middleman of all kinds,—broker, merchant, banker, warehouseman, etc. The elimination, therefore of the middlemen is an important prerequisite if the Hand Loom Industry is to stand on its own legs, and make its contribution to the Planned Programme of Cloth Production in the country.

The co-operative reorganisation suggested in this and other volumes in this Series, of the entire Rural Economy, would achieve this objective. In order to improve the prospects of this Industry, Government have constituted an All-India Hand Loom Board, representative of the Weavers, the Provincial and States Governments, interested in the Industry, as well as of the Central Government. One of the principal recommendations of the Board was to increase the supply of Yarn to the hand-loom weaver by reserving for this branch of the industry at least half the production from the new spindles to be installed under the first Five-Year Programme of Textile Industry Development after the War. Other directions of rationalisation, standardisation of its products, and consolidation of its markets, are also being considered. The Industrial Conference, held in 1947, recommended the creation of a special Board for small scale industries, whose recommendations should be accepted and given effect to as soon as practicable, and whose Chief should be one of the Directors of the Ministry of Industry or of Planning when it came.

For expanding the Mill Industry, the total requirement, according to the Report of the special Panel in that behalf, was estimated at an additional 2.75 million spindles. In order to secure increased supplies of suitable and sufficient yarn for the hand-loom weaver, the Central Government had directed that at least 25 per cent of the new spindles installed must be left uncovered by corresponding looms, so that the yarn produced by them may be available for hand-loom weaving. Some reduction is also given from the duty on imported yarn used by the hand loom weaver. The progress of the industry, however, has not been all that the interest roused in it and the attention

paid to it would justify,—perhaps because of the inherently weak economic position as compared to the mill industry. The competitive system must needs stress this weakness to the disadvantage of the hand-worker. If the planned economy of India is based on an all-round co-operative, rather than the fiercely competitive individualist system of today, the hand-worker will find his due place along with the machine-worker. Considerations of full employment and a decent standard of living for all, as also the demands of the governing ideal of national self-sufficiency, will determine the extent to which power-driven machinery will equip a given industry, as also the degree to which hand-work or cottage industry will form an integral section of the Plan.

Altogether, taking the Cotton Textile Industry as a whole, there is good reason to believe that all the required raw material, skilled and unskilled labour, and capital, equipment, as well as a large market can be found for developing and expanding the cotton manufacturing industry to the target laid down by the National Planning Committee, namely, providing a minimum of 30 yards of cloth per head per annum in 5 years. If the additional spindleage and looms cannot be obtained from other countries, local machine-making industry must be developed. Pending that development, the Cottage Industry or Hand Loom Weaving and Spinnig would have to be developed if the primary objective of planning is to be fulfilled.

### **Statement on Textile Policy**

While these pages were going to the press, a new textile policy was announced by the Industries and Supplies Minister after hearing the opinion of the Provincial Governments and different interests within the textile industry itself.

That policy did not envisage any control on handlooms or power-looms, which meant that about 1,500 million yards of handloom cloth, and 300 million yards of power loom cloth, would be available for free distribution within the country except such part of it as was exported.

The scheme was a flexible one with Government taking full power to requisition the entire mill production, if necessary. The accumulated stocks would be handed over

to the Provinces and States. In order to prevent leakages, often complained of in the past, at the mill end, Government decided that the Provincial Governments and States must nominate their buyers to whom the allotted quota for each region would be handed over. The Provincial Governments would make their own arrangements for opening shops, either of their own, or selecting from the existing retail shops for distributing cloth to the consumer. They had also decided to fix the price of every piece of cloth. Prices had been fixed in the past also; but under the new system Provincial Governments had the power to requisition and to freeze, and, if necessary, even to confiscate the stock in mills within each Province, if they were satisfied that the price-level which had been approved by the Central Government was not being properly adhered to. Stocks equal to four months normal consumption for the whole country were lying in the market, besides about two months stocks lying with the mills.

In regard to stocks already in the market—with the retailers and whole-salers—Government desired that every possible encouragement should be given to traders to bring out these stocks. Full opportunity would, therefore, be given to the latter to sell these stocks by October 31, not at the fantastic prices prevailing today, but at lower and more reasonable prices.

The Provincial Governments were amply empowered to seize stocks, if they found that these were not being sold at reasonable prices. After October 31st cloth must be sold at prices approved by Government, without any quarter or consideration to traders from November 1.

During the interim period new price-marked cloth would begin to come in. Government and their agencies would start purchasing from the mills, and all these stocks would be coming into the markets and sold at definitely lower prices. This would help to reduce considerably any fantastic price which the existing stockists might try to charge.

Government were also considering a scheme for giving rewards to persons giving information about traders selling cloth at fantastic prices. Quick trials and punishment to offenders would follow so that matters might not be delayed in courts of law.

During the past few months, thousands of unauthorised bales of cloth had passed from India to Pakistan. The Provincial Governments had taken strong steps to check this tendency. Drastic provisions would be enforced to penalise smugglers.

In 1946, the total quantity of cloth produced in the Indian Union was 4,000 million yards, and in 1947—3,850 million yards. In the first six months of 1948, 2,130 million yards had been produced, which seems higher than during the previous two years.

Production of yarn had also gone up. As against 1,300 million pounds of yarn produced during 1947 for the first six months of 1948, it was 700 million pounds. Greater production of yarn would directly help to increase the production of handloom cloth.

While it was not Government's intention to interfere with the detailed working of the mills, they would certainly see to it that production did not go down for reasons which could be avoided. They might prohibit the use of superfine counts.

As for the huge profits made by the industrialists during the period between the lifting of textile control and its reimposition from August 1, 1948, no decision had been arrived at on that point. Instructions had been issued, however, that, with a view to keeping up production wherever possible, mills should work three shifts a day. In Coimbatore the Mills had already started doing this. Telegrams had been sent to the Provincial Governments that if quotas were not moved within the period allotted, they would lapse. The lapsed quotas would not be made available to the Province concerned, but would go to other Provinces who were more active. If any Province or State was slack in moving its quota, the local public would not keep quiet, but start an agitation against the Government concerned which would force the latter to be more active.

Practically all exports of cotton cloth from India had ceased except for a few special varieties which were not required in India. It was also difficult to import higher count cotton because of the high prices prevailing in the world markets. The country would perforce have to be self-sufficient in this primary necessary of life.

Lest the Mill Industry should make an excuse of the high prices of cotton to reduce production until remunerative prices were obtained, broad hints were thrown out that the price of raw cotton would also be fixed. The cotton cultivator has had a raw deal in the past on this head; and it is not unlikely that he might have to suffer once again. The price of raw cotton had risen following the removal of control; but the sudden decision to reimpose and enforce control gave a shock to the raw cotton market, from which the regulation of prices may not save it altogether. It has been argued, indeed, that the cultivator had received no advantage from the price rise following the removal of control; and that it was largely the speculative element which had cornered the benefit. If that were true, measures of the type said to be under consideration for the control of the Stock Exchanges may have to be adopted with respect to the Cotton Market also.

## Jute

Next after Cotton, Jute is an important fibre crop which is used for making packing material. It figures both in domestic consumption and in export but, unlike cotton, there are no imports of raw jute or jute manufactures. Figures given below show the acreage and production of Jute in India.

### Acreage and Production of Jute in India.

Year.	Acreage.		Production.	
	All-India.	British India.	All-India.	British India.
1911-12	3.1	3.1	1.5	1.5
1916-17	2.7	2.7	1.5	1.5
1921-22	1.5	1.5	0.7	0.7
1926-27	3.7	3.6	2.1	2.0
1931-32	1.7	1.8	1.0	1.0
1936-37	2.6	2.5	1.6	1.6
1937-38	2.8	2.9	1.5	1.5
1938-39	3.2	3.1	1.2	1.2
1939-40	3.2	3.1	1.7	1.7
1940-41	4.4	4.3	1.8	1.8
1941-42	—	2.1	—	1.0
	Indian Union.	Paki-stan.	Hyde-rabad.	Total.
1942-43	0.8	2.4	—	3.2
1943-44	0.7	1.9	—	2.6
1944-45	0.5	1.5	—	2.0
1945-46	0.5	1.8	—	2.3
	Indian Union.	Paki-stan.	Hyde-rabad.	Total.
1942-43	1,746	7,301	—	9,047
1943-44	1,541	5,449	—	6,990
1944-45	1,236	4,953	—	6,189
1945-46	1,556	6,235	—	7,791

Acreage:—Figures are in millions of acres.

Production:—Figures from 1911-12 to 1941-42 are in million tons. They are from 1942-43 to 1945-46 in thousand bales of 400 lbs. each.

Source:—Figures for 1911-12 to 1941-42 are taken from the Technological Possibilities of Agricultural Development by W. Burns (1944).

Figures for 1942-43 to 1945-46 are taken from Estimates of Area and Yield of Principal Crops in India 1936-46 issued by the Economic and Statistical Adviser (1948).

According to Dr. Burns, the average production from 1911-12 to 1942-43 was 8.4 million bales from an average area of 27 million acres. The highest yield was 11.2 million bales raised from 3.6 million acres. There is a considerable amount of variation in these figures which is explained, as in the case of cotton, by vicissitudes in international affairs, by price variations, by vagaries of the season and by local factors and circumstances like famine, threat of invasion or communal disturbances.

Jute is grown chiefly in Bengal, though Assam, Bihar, Orissa and United Provinces also have some acreage under jute.

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Year	Province	Acres.
1942-43	Bengal	27,55,955
	Assam	2,84,400
	Bihar	2,82,900
	Orissa	28,500
	United Provinces	10,000

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**Source :—** Technological Possibilities of Agricultural Development in India by W. Burns (1944).

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Since the partition of the country, Bengal has been divided into Eastern Bengal and Western Bengal. Much of the area devoted to jute has gone to East Bengal, and, therefore lies in Pakistan as is indicated by the figures given before. On the other hand, the bulk of the jute manufacturing industry is in West Bengal, which must get the greater portion of its raw materials from the Pakistan Province. It is a most effective argument for close and friendly relations and co-operation for mutual prosperity between the two halves of the old Province of Bengal. Assam, however, has possibilities of developing jute acreage, and so also Bihar and Orissa. It may, however, be doubted whether the Dominion of India will be able to make up for the disappearance of the jute area gone into East Bengal for a number of years to come, even if the potentialities of Assam and Bihar are fully exploited and developed.

While India was one and undivided, jute was a monopoly of the country, at least in regard to the raw product. It had no competitor in the world market, and was able, within limits, to dictate its own price. The jute manufacturing industry had also grown as indicated in the next table, but a very considerable balance is still left for raw jute to be exported and being manufactured in Dundee. As this commodity is a monopoly, it could be and has been taxed, both as raw material and as finished product, on export; and the burden of the tax has been, to a large extent, shifted to the foreign purchaser.

### Progress of the Jute Industry in India

Year.	No. of Mills. Total.	Paid up Capital.			Number of	
		Rs.	£.	\$.	Looms.	Spindles.
1929-30	98	Rs. 18,71,65,615 £ 2,525,000 \$. 12,000,000			53,900	1,140,435
1930-31	100	Rs. 19,61,74,249 £. 2,525,000 \$ 12,000,000			61,834	1,224,982
1931-32	103	Rs. 19,76,49,386 £. 2,525,000 \$ 12,000,000			61,426	1,220,586
1932-33	99	Rs. 19,72,05,145 £. 2,525,000			60,506	1,202,183
1933-34	99	Rs. 19,56,54,808 £. 2,525,000			59,501	1,194,405
1934-35	100	Rs. 19,67,69,738 £. 2,525,000			61,387	1,221,786
1935-36	104	Rs. 19,97,07,038 £. 2,525,000			63,724	1,279,460
1936-37	104	Rs. 20,21,52,480 £. 2,525,000			65,273	1,300,077
1937-38	105	Rs. 20,29,05,640 £. 2,525,000 \$. 3,750,000			66,705	1,337,958



Year.	No. of Mills. Total.	Paid up Capital. Rs. a. \$.	Number of Looms.	Spindles.
<b>Province.</b>				
1938-39				
Bihar	3	Rs. 39,00,000	455	11,025
Bengal	98 (b)	Rs. 19,38,01,125 (a) £. 2,250,000 \$. 3,750,000	65,720	1,296,501
Madras	2	Rs. 15,05,000 (d)	805	21,664
United Pro- vinces	3	Rs. 33,49,500	809	18,208
Central Pro- vinces & Berar (c)	1	Rs. 5,00,000	150	3,068
Total :—	107	Rs. 20,30,55,625 £. 2,250,000 \$. 3,750,000	67,939	1,350,466

(a) Capital of two mills not stated.

(b) Includes one mill in French Settlements.

(c) The Mill is situated in Raigarh State.

(d) Capital of one mill not stated as it has other branches of business for which capital cannot be distinguished.

Source:—From the Indian Year Book (1947). P. 745.

The romance of the foundation and expansion of the Jute Industry need not occupy us here. It is worth noting, however, that the industry was practically unknown till about 90 years ago, and has in the last 50 years made perhaps greater progress than the Cotton Textile Industry. Cotton and cotton goods were a product of India from time immemorial; and yet in the production both of raw materials and finished goods, this country no longer occupies the

pride of place. Again, Jute industry was founded and owned almost entirely till the other day by Scotsmen from Dundee; while the cotton industry has been from its start in Indian hands both as regards capital and working. Since the advent of the Industrial Revolution and production of textile goods by power-driven machinery, the cotton manufacturing industry shifted its home to Manchester, England. The latter felt the competition of the Indian handloom so severely that all kinds of handicaps were imposed upon the latter by the British authority in India. It was only when Japan emerged as a powerful competition in cotton manufacture, both to Britain and to India, that the Government of India removed the most atrocious of the handicaps,—the counter-vailing Excise Duty, and began a slow measure of protection to the indigenous industry, which has helped the latter, in the last twenty years, to build up its position as shown in the previous section. The jute industry has had no such vicissitudes. There is no competition for the manufactured jute goods, as Calcutta and Dundee between them monopolise the world market.

It is worth noting that the price of jute is conditioned very much by that of paddy as the Secretary of the Indian Central Jute Committee has observed in a note to Dr. Burns, reproduced in his **Technological Possibilities of Agricultural Development in India :—**

“During the years under consideration the same price co-relation between jute and paddy has been generally maintained. Recently there has been a very serious disturbance in this price co-relation and as paddy is in most cases an alternative crop for jute, this variation in the price co-relation between jute and paddy will definitely vitiate the above conclusion, namely, that the jute crop in any one year is directly co-related with the jute price in the previous season. It holds good only when the price co-relation between jute and paddy remains unaltered.” \*

The prospects of the crop and industry has been summarised as follows by the same authority :—

“Directions, then, in which we can look for progress, are these :—

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\*Op. cit. p 18.

- (1) planting or covering of the area with improved varieties,
- (2) higher yields and less disease incidence as a result of manuring,
- (3) better quality as a result of standard retting technique.

The aim should be for a yield of 20 maunds per acre with quality as follows :—

Root cuttings less than 15 per cent, good lustre, colour and strength. Freedom from faults, fibre not less than 6 ft. With the . . . yield it would require 2,250,000 to obtain the last year's yield of 9 million bales as against the actual acreage required which was 3,300,000. Such a condition of things would set free still more land for good crops. It is presumed that the Bengal Government will continue even in peace time to control the jute acreage."

Jute manufacture is mainly packing material needed for such commodities as food grains, and other dry goods that cannot be packed in lighter material, like paper or card-board, and do not need harder material like wood or metal. Being, however, a monopoly, India is able to charge any price that a consumer can bear; and so gives rise to considerable research to invent substitutes. So far, however, no effective commercial substitute has been invented, though other fibres like sunn and hemp are entering the market. During the last World War the necessity to compress war material sent overseas to be packed so as to economise space to the utmost possible for shipping has led to a number of devices and discoveries which may eventually produce a substitute. For the moment, however, the position of jute remains almost unaffected. The Industry gives rise to no problems corresponding to the control complexities in the case of cotton—raw or manufactured.

Both raw jute and jute manufactures figure on the export side of the Foreign Trade, as the following Table shows :—

**Raw Jute and Manufactures.**

Year	Exports of Raw Jute	Consumption in India*	Proportion of Consumption to exports Percentage.	Exports of sacking bag and cloth	Export of Hessian bags and cloth
1935-36	771	—	—	438	354
1938-39	693	1,112	160	488	451
1939-40	529	1,288	243	511	546
1940-41	241	989	410	445	464
1941-42	276	1,222	443	403	460
1942-43	235	1,202	511	331	273

\* Figures refer to mills in the membership of the Indian Jute Mills Association.

**Source :—** Indian Year Book (1947) P. 746.

There has been a decline in the exports both of raw jute and finished goods mainly because of the War. The decline is much steeper in the former case which is reduced to less than a third of its 1935-36 level; while the fall in the latter is about 25 per cent of that year.

There are not many varieties of Jute, as is the case with Cotton. Attempts have, however, been made to develop a more suitable standard, marketable variety, which have so far not added much to the area or yield of jute.

A good deal of work has also been done in regard to suitable manure, particularly at Dacca Farm where the soil is deficient in lime and phosphate and therefore necessitates the addition of these materials to improve the results. Compost made with water hyacinth and used as manure has also given highly significant results in the yield.

Corresponding to the Indian Central Cotton Committee, there has been established the Indian Central Jute Committee since 1936, following the recommendations of the Royal Commission on Agriculture. All aspects of the industry, from the raw material to the marketing of the finished product, and scientific research devoted to culti-

vation, manufacture and sale, have demanded the attention of this organisation. The diseases to which the jute plant is exposed and pests have likewise been studied. The system of rotation of jute crop so as to enrich the soil by alternative cultivation of jute and paddy, has given good results.

### **Minimum Prices for Jute.**

The Indian Central Jute Committee unanimously decided that the Central Government should accept the policy of fixing minimum prices for raw jute as soon as a point was reached where jute growing was likely to become un-remunerative. It was suggested that the Jute Planning Committee, which would meet in November after the harvesting season, should review the position and approach the Central Government for the fixation of minimum prices to safeguard the interests of the cultivator. An overall increase of about 20 per cent in the acreage under jute in the Indian Union has been achieved. The Committee have requested the Central Government to make special grants for jute development work and for procuring improved work and for procuring improved strains of jute seeds at subsidised prices.

### **Increased Grant.**

The Standing Committee of the Central Legislature had recommended that the grant to the Central Jute Committee be raised from Rs. 5 lakhs to Rs. 10 lakhs. They had emphasised that a major portion of this grant must be spent on increasing the production of jute in this Dominion. The Director of Jute Agricultural Research had explored the possibility of producing jute in some areas in Madras, Travancore and Cochin. Jute-seed had been sent there for sowing in experimental plots. The Director estimated that the acreage of additional land brought under jute in the Indian Union in 1948 would be 1,50,000, and the increased cultivation would yield an additional quantity of not less than four lakh bales of raw jute.

The total export of East Bengal raw jute to Calcutta and other foreign countries amounted to 2,32,40,000 maunds or 46,48,000 bales during the period between July 1947, and April 1948. Of this 41,34,000 bales were exported to Calcutta by vessels and country boats, and 5,14,000 bales "via" Chittagong to overseas countries. In terms of

money the jute export "via Chittagong" during March amounted to Rs. 191 lakhs and during April to Rs. 221 lakhs. These figures do not include jute carried by railway.

Another interesting feature is that while the export of raw jute "via Chittagong" amounted to 5,14,000 bales during the nine months of the current jute year, 1948-48, the highest figure of jute export "via Chittagong" during the past 15 years was only 239,000, the minimum annual export during that period being 99,000 bales. As many as 23 jute firms have so far registered in East Pakistan after the partition of Bengal.

Regarding offers for jute baling presses and jute mill machinery, an official Bulletin stated that fully reconditioned jute machinery was available from some foreign firms. One firm in Northern Ireland is in a position to supply jute machinery, including 16,000 spinning spindles with the necessary preparing machinery.

### **Pakistan Jute for India. Five Million Bales Promised.**

Under a recent agreement between this country and Pakistan, India will get from Pakistan five million bales of jute during the current season. The major portion of this jute quota will reach India by December this year. The Indian Jute Industry will thus be restored to Pre-Partition level, and no shortage will be left. A comprehensive review of the progress of the all-embracing inter-Dominion agreement on the exchange of essential commodities concuded in June 1945 was also made at an Indo-Pakistan Conference held at New Delhi on August 12.

## Other Fibres.

The area and yield of other Fibre Crops is given below :—

### Area under Other Fibres in India \*

(thousand acres)

	Area All India.	Area British India.
1911-12	..	688
1916-17	..	832
1921-22	837	682
1926-27	975	802
1931-32	1,037	684
1936-37	921	760
1937-38	931	735
1938-39	..	713
1939-40	.	775
1940-41	..	831
1941-42	..	..
1942-43	..	..

\* These figures are taken from Dr. Burn's Technological Possibilities of Agricultural Development in India 1944.

\* Op. cit. Statement 20.

There have been considerable variations in the acreage and production of these other Fibre crops; but no very satisfactory explanation can be given of those variations. The price factor is no doubt, important, and explains such sudden rise in acreage under those crops as that which occurred in 1925-26, when jute also had reached a very high price level. Though there is, so far, no effective competitor of jute as a commodity of international commerce, when its price reaches prohibitive level, it is bound to bring out even very remote competitors.

It is regrettable that, with the exception of cotton and jute, India's Fibre Crops have not received the attention which is their due. The most considerable indigenous

fibre plants are :—Sunn-hemp, Deccan hemp, Coir, from the cocoanut, and Agaves. Besides these, which are commonly raised, there are others, grown on Experiment Farms, or Government Gardens, viz:—Rozelle, Bowstring hemp, Manila hemp, Ramie, New Zealand hemp, and Flax. On the last named, experiments have been made in recent years. There are two other plants, which grow wild, but which in other countries have been tried as substitutes for jute viz. **Thespesia Lampas**, and **Urena Lobata**. Rozelle also has been tried as substitute for jute, as also Banana Fibre, which has a good matting potential. Any number of wild grasses are used for making baskets of which no account can be given. Basket making is, however, a very considerable cottage industry, which has shown its possibilities in making bags, suit cases, ropes etc. It has a promising future.

The main reason why these plants have not received much attention is that, apart from Sunn-hemp, they do not attract "Big Business." The War forced attention to Sunn-hemp, or Sisal as useful for making camouflage nets. Apart from that, the trade went its way, getting what it could from unorganised producers. The exported Sunn-hemp has received a measure of control. With effect from December 1942, its export was forbidden, if not graded in accordance with the Sunn-hemp Grading and Marketing Rules, 1942. The price fluctuations in the world market of this article have been enormous, and so discouraging to any intensive and scientific cultivation or development of this branch of agriculture.

It has been said that there is no true **Sisal** in India, which is much better in quality than any other **Agave**. It can be grown on any land. Up-to-date, however, no attempt has been made on any considerable scale to grow this plant, partly because it requires considerable capital investment and waiting, without much hope of an early proportionate return due to the competition of Jute; and partly, also, because of lack of adequate water and transport facilities needed by Sisal plantation on a large scale. While jute is available in such abundance, and no effective substitute is found for it, there is little hope that profit seeking business men would think of it. A few attempts have been made, in the last forty years to grow it on a commercial scale, but without much success. Dr. Burns observes, in his work so often quoted :—



\* "It seems doubtful whether, after the War, India should attempt to compete in the **Sisal** market, particularly in view of the enormous fluctuations in price which the fibre has undergone in the past, and of the large supplies which were previously available from East Africa."

Several varieties are grown on an unorganised scale along roads, canals or railways. Recently this fibre has been spun into yarn by the Ganges Rope Company but that was a war-time venture which may not be effective under normal competitive conditions. **Sisal** also makes an excellent hedge plant, presenting a solid front against any intruder, man or animal but for that there are still cheaper and more widely spread substitutes—like **Thor**—available everywhere.

The Indian Council of Agricultural Research has financed research in Sunn-hemp to improve cultivation by discovering the best seed; to improve processing by determining the best time for cutting the fibre, and the best methods of **retting**, and to find methods of producing pure seed from improved varieties. The author of the **Technological Possibilities of Agricultural Development in India** notes three directions in which future research and development should take place viz :—

- (i) An all out drive to improve the quality of Sunn-hemp.
- (ii) Establishment of public plantations of **Sisal**, and Manila hemp to determine its commercial possibilities, and
- (iii) Establishment of a Fibre Research Station in some suitable area for studying the agricultural, commercial and technological possibilities of all other fibres, and particularly whether or not to go on with Flax and **Sisal** on a commercial basis.

In a planned economy aiming at self-sufficiency, such enterprise would be welcome, particularly in view of the loss of jute due to Partition. In the absence, however, of adequate research and definite ground to make more ambitious experiments, the Planning Authority will not be able to say exactly what area should be devoted to this crop. It must remain among the miscellaneous developments that must form the fringe of the Plan.

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\* Op. Cit. p. 95-96.

## Tobacco.

This is another cash crop, which has recently grown very much in importance, both as an article of export for local consumption, and as a raw material for a promising industry. The following figures of area and yield are taken from the sources used for other crops :—

### Acreage and Production of Tobacco in India.

Year.	Area All-India. (Thousand Acres.)		Area British India. (Thousand Acres )		Production in British India. (Thousand Tons.)	
1931-32	1,222		1,044		429	
1936-37	1,225		1,048		444	
1937-38	1,317		1,137		469	
1938-39	..		1,156		464	
1939-40	..		1,181		449	
1940-41	.		1,126		423	
1941-42	..		.		..	

  

	Indian Union	Paki- stan	Hyde- rabad	Total	Indian Union	Paki- stan	Hyde- rabad	Total
1942-43	782	338	63	1,183	278	138	15	431
1943-44	648	306	65	1,019	240	121	15	376
1944-45	837	198	30	1,065	310	88	7	405
1945-46	941	198	81	1,220	312	93	19	424

Source:—1931-32 to 1941-42 from Technological Possibilities of Agricultural Development in India. By W. Burns. (1944).

1942-43 to 1945-46 from Estimates of Area and Yield of Principal Crops in India 1936-46, issued by the Economic and Statistical Adviser (1948).

On an average over a million acres yielded in undivided India something less than half a million tons of raw tobacco. Partition has lost India about a third of the area under tobacco, and a corresponding amount in yield. In recent years, with the slackening of the campaign to Grow-More-Food, the yield in this Indian Dominion has been growing. There have been considerable fluctuations from year to year in the area occupied by this crop, as is the case with all cash crops.

The crop is grown in almost every province, and State, under every climate and soil conditions. Madras, however, and the States in South India have the greatest area and yield of this material. India is the largest producer of Tobacco in the world, having produced 1,543 million lbs. in 1935-36, or 241 per cent of the total world production. The export of this article was less than 2 per cent, or some 27 million lbs. The article is not exposed so much to the vicissitudes of the international price-level, as for instance cotton or jute. Once a luxury somewhat frowned upon by public opinion in the older generation,—Tobacco smoking has become almost a necessity to all classes and both sexes. Local demand, therefore, prevents exports rising unduly. The domestic use in bidis, hukahs, for chewing, or as snuff is considerable. But the modern use as cigar or cigarette is growing rapidly, and is likely to supersede the more traditional uses. There is considerable difference of opinion about the sanitary aspect of tobacco consumption or smoking. Many authorities hold nicotine to be poisonous. But not the same zeal is shown in the curtailment if not prohibition of this consumption as in the case of opium or intoxicant drinks or drugs. By force of imitation, if nothing else, the consumption is likely to increase, and so also the area devoted to this crop. Incidentally, it is becoming a good source of revenue to the State. The tax,—a sort of excise,—is levied on the same basic lines as intoxicating drinks.

The cigarette making industry, on a modern mechanised scale, owes its origin, according to Dr. Burns, to the Indian Leaf Tobacco Development Company, which is a subsidiary of the Imperial Tobacco Company. During the War, owing to the growing shortage of food grains, when all cash crops were coming under restriction in favour of the Grow-More-Food-Campaign, some reduction was made in the area devoted to this crop. In cigarette

making Indian Tobacco was mixed with American varieties. But owing to the War, it was impossible to import freely, and so a limit was placed on such mixture. The maximum of American Tobacco that could be put into cigarettes made in India was fixed at 13 per cent. This has naturally increased the demand for Indian Leaf Cigarettes in this country, and it is likely that in proportion as the food shortage is reduced, or the need for an export surplus rises more of this crop can be grown.

The main problem of a technological nature is the development of a more suitable and productive leaf. Though Guntur in Madras is the main centre for the Cigarette industry, that is not the only soil or climate under which tobacco leaf can be grown successfully. Bengal had almost as much area devoted to Tobacco as Madras. Many varieties,—chiefly American have been tried with varying success. Others have been evolved at Pusa, which promise good results. It is impossible to say, so far as Indian soils and climate conditions are concerned, which milieu would suit tobacco cultivation, and which will not. Tobacco, in fact, can flourish under almost any soil and climate. Besides, both soil and climate difficulties can be counteracted. In Baroda, the climate being dry, they have introduced an air-conditioning cellar. Such handicaps of the soil as affect the crop can be got over by adequate and suitable manure. Tobacco manuring has, in fact, been worked out to such an extent that definite formulae have been evolved for the particular soil where a given brand is grown. In India, also, the Guntur Tobacco Research Station has made experiments with fertilisers for tobacco, which have yielded some useful results. It is a valuable cash crop on which manures would be no burden.

The local market is also not likely to go down particularly in regard to the use of Tobacco in the "huka", for chewing, or as snuff. It may be that the demand for the indigenous "bidi" may suffer because of the growth of the cigar or cigarette or pipe-smoking. But the relative costliness of the cigarette habit would effectually prevent a large percentage of the town-dwelling working class, amongst whom this habit seems to be rapidly growing, from developing that consumption. In any case, there is a promising future for this crop wherein National Self-Sufficiency is an existing fact; while the export as

well as domestic market can be easily developed without much addition to the acreage under that crop.

This crop has its own weeds or pests, or parasites, which affect the leaf, as happens to other crops. Ways and means have, however, been found to arrest the growth of such parasites, and so save the plant. Further intensive research is, however, required to find more effective remedies against this parasite plant.

Reviewing the present conditions and possibilities in regard to this plant, Dr. Burns concludes:—

(1) "The amount of cigarette tobacco produced in this country in the last year for which we have figures is 99,841,000 lbs. It may be taken that this tobacco was produced from 110,188 acres estimating an yield of 906 lbs. per acre. This cigarette tobacco acreage is mainly in Madras Province (Guntur and adjoining district), Mysore State, Hyderabad State, the United Provinces and Bihar.

(2) Attempts should be made to try out a group of cigarette tobacco varieties in various Provinces, and a scheme has already been prepared by the Agricultural Commissioner with the Government of India in which 18 such centres are suggested, at each of these centres, proposals have also been made for simple manurial trials, and for trying out the practices of topping and suckering.

(3) As good flue-curing is an essential part of cigarette production, the training of expert flue-curers is essential. It is understood the Imperial Council of Agricultural Research is arranging for the training of a limited number of curers at Guntur and it is suggested that this process should be speeded up."

The cigarette tobacco is grown only on about a tenth of the total area under this crop. If these recommendations are adopted, the tobacco area would be something like 200,000 acres and would yield 150,000,000 lbs. of good flue-cured tobacco which would be more than sufficient for all domestic needs. For purposes of export, grading is also required. There would be no need to add to the total area under this crop as other methods can more than maintain our National Self-Sufficiency in this behalf.

## Tea.

Tea ranks with Jute and Cotton among the principal exports of the country, and a high level cash crop. Whether or not Tobacco was introduced from outside, Tea seems to be definitely a foreign crop which, however, has become thoroughly acclimatised so that India ranks amongst the principal Tea Exporters in the world. The area occupied by it and the yield are given below:—

### Acreage and Production of Tea in India.

Year	Area All India.		Area British India.	Production British India Only.	
	(in '000' acres)		(in '000' acres)	(in '000' tons)	
1911-12	..		542		113
1916-17	.		602		157
1921-22	710		661		114
1926-27	740		685		163
1931-32	795		719		162
1936-37	822		738		161
1937-38	824		739		175
1938-39	..		737		184
1939-40	..		737		183
1940-41	..		739		188
1941-42	..		..		..

  

	Indian Union.	Paki-stan.	Hyde-rabad.	Total.	* Indian Union.	Paki-stan.	Hyde-rabad.	Total.
1942-43	731	108	—	839	490,021	73,846	—	563,867
1943-44	730	108	—	838	497,003	74,771	—	571,774
1944-45	730	108	—	838	447,904	63,485	—	511,389
1945-46	730	109	—	839	501,661	73,330	—	574,991

\* figures in '000' of lbs.

Figures for 1911-12 to 1941-42 are taken from Technological Possibilities of Agricultural Development in India, by W. Burns.

Figures for 1942-43 to 1945-46 are taken from Estimates of Area and Yield, 1936-46, issued by Economic and Statistical Adviser, 1948.

There has been some slight objection in certain quarters to the rapid spread of the tea-drinking habit in the country, but that has not affected the export value of this crop. Partition has affected in a minor degree the area as well as the yield of this crop, in the Indian Union; but is not likely to affect its export position to any considerable degree. Something like three-quarters of a million acres, yielding over 150 thousand tons of tea, gives India a very substantial position in the world market.

The crop is mainly centered in North India along the slopes of the Assam Hills, but a considerable portion is also derived from the Nilgiri Hills in the South. With the uncertainty of the Chinese market, the demand for Indian Tea has grown. During the first World War (1914-18) there was a sharp rise in the price because of the large purchases for the British Armies. Production was, therefore, maintained at a very high level up to 1920, after which a severe slump followed mainly because of the unloading of Government-held stocks of Tea on the British market. Prices came down to an unproductive level and so there was a danger of the cultivation being abandoned. Efforts were, therefore made to improve the quality so as to get more remunerative prices. Finer plucking and better curing had to be adopted to make the product more marketable. A special cess was levied to maintain the quality of the product to be sent abroad. The quantity was, also, incidentally reduced because of finer plucking, though the arrangement was entirely voluntary made by and for the planters themselves.

From 1922 to 1926 prices improved and the crop also steadily increased. With the coming of the world depression in the early thirties, the market was found to be overstocked with the result that there was a heavy decline in the prices. To arrest the progress of this depression, in 1933 an International Agreement had to be made, whereby the crop produced was regulated, each tea-producing country getting its quota so as to meet the aggregate demand of the world for tea. The chief purchasers and producers of tea were signatories to this Agreement. The quota allowed for each of the producing countries was expressed as a percentage of the standard export, to be decided by the International Tea Committee with its headquarters in London.

The standard export for India was 382,594,779 lbs. which is about two-thirds of the total Indian tea crop. It was subsequently increased to 383,242,916 lbs. and the percentage to be exported of this standard crop in 1933 was fixed at 85 p. c. After the beginning of World War II and the consequent stoppage of tea supplies from the Netherlands East Indies because of Japan's participation in the war, the percentage of the standard export from India rose in 1943 to 125 percent of the original. After this Agreement there have been fluctuations, but they are of a minor character mainly due to climatic reasons. The area under tea had been showing a steady increase up to 1931, but since 1933 the area has remained more or less constant, thanks also to this agreement. There is no question of India's self-sufficiency in this regard being endangered.

As in the case of tobacco, tea is an article both for internal consumption as well as export. As the figures given above show, however, export is a much larger percentage of the total local production. In the case of tea it is as much as 65 per cent. to 70 per cent., while in the case of tobacco only 2 per cent of the total crop finds a market abroad. Tea is, moreover, a crop which requires processing before it is ready for export or consumption at home, and as such it is an industrial as well as an agricultural occupation. The tea-gardens of India and the factories attached are mostly Anglo-Indian concerns, which are often registered as joint stock companies in Britain, and their capital in sterling. To this country, therefore, the net benefit from the growth of this crop, and the expansion of the industry based upon it, is very little.

Labour conditions in Tea Plantations, as in the case of most other plantations, have been a matter of very serious complaint in the past. The beginning, in fact, of the existing Labour Legislation in India had to be made in connection with the Tea Planters of Assam where less than human conditions were allowed to the coolie workers engaged. Even today, those conditions are anything but unexceptional to those in any way connected with organised labour. Taking a measure of decency in the treatment and remuneration of such workers, special suggestions have, therefore, been made for adequate legislative protection to workers in the volume in this Series dealing with Labour. They are more likely to be observed now under an Independent India than was the case before, when the Planter community was made up entirely of Anglo-Indians



who had the ear of the ruling class, and were thus able to evade the just return for their ill-treatment of indigenous labour.

### Coffee.

In comparison with Tea, Coffee occupies very small acreage, and yields also a very small quantity. Except in the South, this beverage does not find much favour for local consumption. The area devoted to this crop and the yield are shown below:—

#### Acreage and Production of Coffee in India.

Year	Area All India. (in '000' acres)	Area British India (in '000' acres)	Production in British India (in '000' tons)
1911-12	..	94	..
1916-17	.	91	..
1921-22	203	97	8
1926-27	202	91	10
1931-32	195	92	9
1936-37	214	98	9
1937-38	209	98	9
1938-39	..	96	11
1939-40	..	96	9
1940-41	..	96	9
1941-42	..	..	..

	Indian Union	Paki- stan.	Hyde- rabad.	Total.	* Indian Union	Paki- stan.	Hyde- rabad.	Total
1942-43	194	—	—	194	16,257	—	—	16,257
1943-44	198	—	—	198	17,240	—	—	17,240
1944-45	201	—	—	201	17,300	—	—	17,300
1945-46	212	—	—	212	25,200	—	—	25,200

\* Figures in '000' lbs.

Figures for 1911-12 to 1941-42 are taken from Technological Possibilities of Agricultural Development in India, by W. Burns.

Figures for 1942-43 to 1945-46 are taken from Estimates of Area and Yield of Principal Crops, (1936-46) issued by the Economic and Statistical Adviser, 1948.

If there be an objection to the spread of the Tea habit, coffee would be even more open to the same objection. India, however, is self-sufficient in this article, too, even though she is not an exporter. Coffee requires very specialised conditions of climate,—on hill slopes with fairly moist atmosphere,—which are not easy to satisfy all over the country; and as such, there is not much scope for expanding the area and increasing the yield, to make India an effective competitor with Brazil in the world market. There are many more profitable alternative crops, in which India can easily be a good surplus producer able to export economically; and so may best concentrate attention on those.

## Sugar.

A cash crop of very considerable money as well as food value, which is of comparatively recent growth, is sugarcane. The latter aspect and its value as raw material for a large-scale industry, being more important now-a-days, we have included it under cash crops.

Prior to 1930, most of the white or refined sugar consumed by India was imported from Java, Mauritius and Cuba in the West Indies. Following the recommendations of the Royal Commission on Indian Agriculture, it was found that the land, its soil, climate and water supply were perfectly suitable for India to produce her own sugar in modern mechanised refineries from cane. The sugar thus produced would have none of the objections on medicinal or other grounds that subsidised beet-sugar had in Western countries.

The Sugar Industry, however, established in the Dutch East Indies, in Mauritius, and the West Indies, had too strong a position in the Indian market to be easily shaken, unless the indigenous sugar industry of India received sufficient fiscal protection. When Government considered the Agriculture Commission's recommendation, and decided to supplement those of them as were suitable, the sugar industry came to receive full attention. The authorities were satisfied that there was a good *prima facie* case for protection to the proposed industry on the lines accepted by Government following the report of the Indian Fiscal Commission.

A special Tariff Board was appointed to consider ways and means of fostering and developing that industry in this country. In view of the competition from long established sugar producers, very heavy protection had to be given for a definite period of 15 years, if the country was to be self-sufficient in an important crop of almost universal consumption. Though refined sugar was used widely by the upper classes, and the masses were content with gur, the prospects of rapid development of that industry in this country were too obvious to be overlooked. The Tariff Board recommended very substantial protection, amounting at one time to as much as 180 per cent.; and the protection was guaranteed in the first instance for 15 years to enable the industry to overcome initial difficulties.

The area devoted to cane cultivation rose in consequence of this protection and the consequent increase in the demand for cane also rose rapidly as also the yield from that area. The industry built upon it also thrived till practically all foreign imports became unprofitable, and National Self-Sufficiency in an important requirement was attained though at considerable cost to the consumer. The following table shows the area and yield of cane:—

### **Acreeage and Production of Sugarcane.**

Year.	Area Brt. India. (million acres)				Production Brt. India. (million tons)			
1911-12	2.4				2.4			
1916-17	2.4				2.7			
1921-22	2.3				2.5			
1926-27	2.9				3.2			
1931-32	2.9				3.8			
1936-37	4.2				6.1			
1937-38	3.7				5.1			
1938-39	3.0				3.2			
1939-40	3.5				4.3			
1940-41	4.4				5.4			
1941-42	3.3				4.0			
	Indian Union.	Paki- stan.	Hyde- rabad.	Total.	Indian Union.	Paki- stan.	Hyde- rabad.	Total.
1942-43	3.0	0.5	.03	3.53	4.3	0.6	.07	4.97
1943-44	4.0	0.6	.03	4.63	4.9	0.7	0.1	5.7
1944-45	3.0	0.6	.06	3.66	4.6	0.7	0.1	5.4
1945-46	3.1	0.6	.05	3.75	4.4	0.8	0.1	5.3

Source:—Figures for 1911-12 to 1941-42 are taken from *Technological Possibilities in Agricultural Development in India*, by W. Burns. (1944).

Figures for the years 1942-43 to 1945-46 are taken from *Estimates of Area & Yield of Principal Crops in India, 1936-46*. Issued by the Economic and Statistical Adviser (1948).

The expansion in the area is comparatively less than that in the yield. There have been considerable variations in the case of this crop as shown by these figures, but the variations are explained by the same factors as in regard to other commercial crops. Under the latest figures, for a total acreage of 3.7 million for All India in 1945-46, the yield was 5.3 million tons, working out at something like  $1\frac{1}{2}$  tons per acre. As explained below, where the land is organised scientifically and cultivated economically, the average yield is much greater, and therefore the profit to the factory owner much larger.

Much of the crop is now derived from improved seed discovered by experiment at the Coimbatore Sugarcane Breeding Station. The total area under improved varieties of cane in 1941-42 was 2.8 million acres and in 1942-43, 3 million acres, representing approximately 77.9 per cent and 80.0 per cent respectively of the total area. The number of Factories has also grown from 57 in 1932-33 to 167 in 1944-45, of which 140 were working. The total sugar derived from cane in 1944-45 was 953,500 tons which was a shrinkage of 21.6 per cent. as compared to the preceding year. The percentage of recovery has also increased, the latest being 10.31 per cent.

Sugarcane is grown in all parts of the country, though there are two Provinces,—namely the United Provinces and Bihar,—that between them produce over three-fourths of the total crop, as well as the total quantity of sugar. There is no proper organisation of sugarcane cultivation in those Provinces, which is left to the individual cultivator. The factories located at convenient centres in the sugar producing areas make their own terms to buy cane from individual cultivators as and when it is wanted. Compared to the refining company, the cultivator is poor, weak, ignorant, and so unable to get the best terms. On a strictly competitive basis, the cultivator does not stand much chance of a fair deal, as the crop is of a perishable nature which could not be held for too long, even if the cultivator had some staying power. The factories, however, could arrange their work in such a manner that they could afford to wait.

The result was that the primary producer of the raw material did not benefit at all in proportion to the heavy import duty paid by the consumer and levied for the benefit of the industry in the hope of making the country self-

sufficient. While the consumer paid twice or three times the competitive price of sugar, if there had been no protection, the original producer of the raw material from which white sugar was made, did not receive any proportionate benefit. It was urged and hoped that once the industry had become well rooted a part of the surplus value would be passed on to the consumer in the shape of reduced prices. This is said in the case of all industries seeking fiscal protection, but never happens. And it happened in the case of sugar. For when the War effectively shut off all outside sources of supply, the industry demanded its full monopoly price. Government had, therefore, to intervene in the interests of the cultivator and fix the minimum price for cane delivered at the factory. These prices were by no means extravagantly high; but even so, the factories were able to get round or, at any rate, the cultivator failed to get the full benefit of such fixation meant in his behalf.

In other parts of the country, particularly in Bombay where other conditions are not quite suitable as in the United Provinces and Bihar, far-seeing industrialists seem to have bought up or leased the land on which cane is grown for feeding the factory by the owning Company, and established cane-crushing and sugar refining factories in the midst of such area. The number of cane factories working in India in 1946-47 was 141 and their production totalled 928,200 tons, and sugar refined from gur was 4,000 tons.

During the following year 1947-48, the number of cane factories working was 140 which produced 950,000 tons, while the sugar refined from gur was 4,000 tons.

The total production of Sugar in India for these two years was 1,042,200 tons and 1,064,000 tons respectively, while there were no nett imports as against those of 1932-33 and 1944-45 which were 321,081 tons and 30 tons respectively.\* These lands have been developed by means of modern scientific methods and implements of cultivation; rotation of the crop was so arranged that practically throughout the season the factories received their quota of daily crushing even manure provided of the required quality and quantity. The seed was steadily improved till the yield per acre rose phenomenally. The total acreage under sugar cane for the year 1932-53 was 3,425 thousand acres, while the acreage under improved

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\* Source:—The Indian Sugar Industry 1946-47 Annual.

varieties was 1,845. For the same year the average cane production per acre was 14.9 tons, and gross production expressed as gur was 4,859 thousand tons.

The maximum percentage of recovery of sugar in factories in India for the same year was 10 per cent. In the year 1943-44 the total acreage under sugar was 4,389 thousand acres, and that under improved varieties was 3,545.

The average cane production per acre was 13.8 tons and gross production expressed as gur was 6,063 thousand tons.

The maximum percentage of recovery of sugar in factories in India for the same year was 12.84 percent. The figure for the following years show a slight fall. For 1946-47 the total acreage under sugar cane was 4,108 and the gross production expressed as gur was 5,576 thousand tons.

Average production was 9.86. Similarly, the yield of juice from the cane rose in proportion; it was possible to establish other industries dependent upon sugar or connected with it, other economies such as transport, manuring of the crop, improvement in labour conditions like wages, housing, continuous employment, medical attendance, and consequently the efficiency of labour, production of power alcohol, utilisation of bagasse as fuel so as to economise in coal consumption, organisation of a stock-breeding branch, with a view to secure manure and also to build up a dairy industry, all these and many more have been inter-linked, so as to make a regular pyramid of mutually connected industries. In this organisation the factory is not dependent upon the vagaries of cultivators, or even the variations in the seasonal rainfall or other such requirements. Soil conditions were and could be improved, transport facilities expanded, and all internal as well as external economies secured.

No doubt, such well-knit, coordinated, organised enterprises reaped a heavy profit, which was considerably increased during the War, and on account of the closing up of any channel of competition that may have remained. So high did the prices threaten to rise that a measure of control had to be adopted by way of fixing a price level and rationing available supplies. Stocks, however, could not be mobilised effectively; hoarding could not be prevented; movement of raw material to factory and of finished goods

to consumers could not be aided because of the transport bottle-neck, and Black Market flourished beyond belief. A countrywide outcry against these control measures, and allegations of corruption in the administrative machinery of control, led the Government of India, towards the end of 1947, to de-control sugar. At that time it was sold under control at something like Rs. 21|12|- per maund as against the pre-war price of Rs. 8|- or Rs. 9|- per maund, including the heavy import duty. The sugar production had, as already mentioned, reached sufficiently high to be able to supply the entire domestic market by itself, and by the gur produced in the more primitive methods followed by the rural masses. With the disappearance of Control, prices rose to Rs. 40|- or more, though the official Sugar Syndicate fixed it at Rs. 35|- per maund. Even so the consumer was taxed very heavily for the benefit of the sugar manufacturer, while the cultivator's price was raised by Rs. 2|- per maund as a sop to the rural masses most likely to be the influential element under the new regime.

The cane cultivation and sugar industry in general has received scientific attention, no less thoroughly than fiscal protection. Cane seed has been studied very carefully at the Coimbatore Agricultural Research Station; and several varieties have been produced which are calculated to be suited to different conditions of soil and climate. The yield of cane from some of these varieties is much higher. A Sugar Industry Technological Institute was also established at Cawnpore to study Sugar Technology, and also to improve the yield of juice from cane as well as the quality of sugar by all the available scientific devices. The main lines of programme for developing both the crop as well as the industry are:—

- (a) to select cane better suited to sugar growing areas than the existing varieties; and improve their process of cultivation;
- (b) the methods of making gur commonly practiced were also to be improved, and
- (c) the development of an Advisory or Research Service for the benefit of cultivation and industry as a whole.

The task of selecting proper seed has been attended to, as already stated, very successfully at Coimbatore, while the Technological Institute at Cawnpore has also



gone a long way to study the scientific side of the material and the industry based upon it.

An Indian Sugar Syndicate was formed in 1937 as a voluntary organisation corresponding to the Tea Planters' Association. In the years that followed the Governments of the Provinces chiefly concerned in the cultivation of cane, namely the United Provinces and Bihar, recognised this Syndicate, and compelled all factories in those two Provinces to become members of the organisation. The Syndicate fixed minimum selling prices of sugar, and regulated the sales of members' production by allotting delivery quotas to each factory. This helped to stabilise prices before the War gave it such a fillip that the industry became one of the most profitable in the land.

## MISCELLANEOUS.

### Indigo.

This crop, of which the area and yield are given below, has declined very materially since the beginning of this century.

#### Area and Yield of Indigo.

Year.	Area British India. (in thousand acres)	Production British India. (in thousand cwts.)
1911-12	268	48
1916-17	764	94
1921-22	329	67
1926-27	103	19
1931-32	53	10
1936-37	42	7
1937-38	38	6
1938-39	40	6
1939-40	38	5
1940-41	65	11
1941-42	..	..
1942-43	..	..

Source:—Figures are taken from the Technological Possibilities of Agricultural Development in India by W. Burns 1944. (Statement 21).

Once upon a time it was the monopoly of India providing fast dyes and colours for the cloth or silk industry for perhaps the whole world. Since the invention, however, of coal-tar, aniline and alizarine dyes, the importance of fast vegetable colours or dyes has very sharply and rapidly declined. These latter are comparatively so cheap, and so capable of mass production that the agricultural product, Indigo, must necessarily suffer in comparison.

India cannot revert now to Indigo cultivation with a view to make dyes or colours out of it, whether for her own

consumption or for export. The acreage withdrawn from this crop has already been diverted to other crops. There is consequently not much prospect of improvement either in the yield or cultivation. The slight increase that had taken place during World War I, was due entirely to the closure of the foreign sources of dye supplies during and owing to the War. A much smaller, but still noticeable, improvement was also found in the course of the second World War for the same reasons and after the War the same fate as before has attended indigo cultivation.

Another volume in this Series, that relating to Chemical Industries, has already examined the prospects of the Dye Stuff Industry. A special Panel or Committee of the Government of India has also reviewed our position in this behalf and made their recommendations. Nothing need, therefore, be added in this place, beyond observing that Dyes and Colours are an important ingredient of the Textile Industry which is among the largest modern industries in India. They are part of a very large scale modern Chemicals Industry which no country, aiming at National Self-Sufficiency, and having sufficient resources for the same, can afford to neglect. India has ample resources in the way of raw materials, and can easily procure the mechanical and other equipment necessary for building up a large scale Dye Stuffs Industry along with other Chemicals in the country. The connection between this and modern armaments industries need not even be mentioned. Trained chemists are likewise not wanting; so that the prospect of this industry, apart from the agricultural produce, are quite favourable.

### **Opium, Cinchona, Indian Hemp, Other Drugs & Narcotics.**

Yet another article of agricultural produce, which in the past used to be an Indian monopoly, and figured very substantially on the export side, has shown a very substantial decline in recent years. The Table given below does not give any indication of the real importance or value of this crop as the figures include many other drugs and medicines.

### Acreage under Opium, Cinchona, Indian Hemp and Other Drugs and Narcotics in India.

Year.	Area British India only. (thousand acres)
1911-12	268
1916-17	405
1921-22	319
1926-27	237
1931-32	239
1936-37	205
1937-38	195
1938-39	200
1939-40	198
1940-41	208
1941-42	..
1942-43	..

Source:—Figures are taken from the Technological Possibilities of Agricultural Development in India by W. Burns (1944).

Indian Opium was famous all through the East. Large blocks of culturable land used to be assigned to poppy cultivation in Malwa, Central Provinces, United Provinces, and Bihar. The British Government of India had made a virtual monopoly for the East India Company of Opium production in a saleable form, and used to derive a very substantial revenue, either from the sale proceeds of opium made at Gaziabad from poppy cultivated in British area, or by a special Excise or Transit Duty on Poppy cultivated in Malwa and Opium made in Indian States in that region. Not so long ago Opium smuggling, and its transport in country craft to China, was the most romantic amongst the overseas trade carried on by Indian merchants permitting enormous fortunes being made, and also bringing ruin to large numbers because of the inevitable speculation connected with it.

There has been at least one big war with China, which was the most considerable market for Indian opium, to enforce the East India Company's right to export Opium and so progressively demoralise the Chinese people. In the

course of time, however, the British Non-Conformist conscience, a most amazing phenomenon, woke up to the deleterious effects of Opium consumed by the Chinese people. A surging wave of hot indignation swept the country in the press, on the platform, or in Parliament, which tried to put an end to that trade by whatever action Parliament could take in that regard. By the end of the last century, enlightened Indian opinion also supported that view point, though it involved a loss of Rs. 10 or Rs. 12 crores of clear annual revenue, the burden of which was borne almost entirely by the foreigner. Matters were too ripe by the end of the last century to delay action much further; and so a treaty was made by the British Government and the Chinese to discontinue progressively this abomination.

To make up for this sacrifice, new taxation had to be imposed or existing taxes increased in the country itself. From and after 1905 the Government of India progressively reduced its opium production or export till within ten years or so it was expected to disappear altogether. The land devoted to poppy cultivation had to be diverted to other cultivation and, in fact, has been so diverted to cultivating wheat, pulses or similar crops in Central India, United Provinces and Bihar. It took some years for the land to be readjusted to the new crops; but from the point of view of the change over, the food position cannot be said to have suffered by the loss of acreage devoted to poppy cultivation. The loss of revenue has been made up by additions to the direct taxation; while the disappearance of a very considerable article of export was slowly made up for by developing the export of cotton and jute, both raw and woven, to other markets.

Some slight cultivation of Opium is still continued but only for consumption as medicine. The nineteenth century importance of the crop has gone for good. Criticism of the entire opium policy has been severe, particularly from those Indian States who used to grow poppy on a large-scale, and whose stocks of opium were rendered useless and frozen under a Treaty prohibiting that trade. The possibility of manufacturing opium into medicinal preparations has been investigated very fully. Modern anaesthetics uses more and more such drugs to deaden pain. Considerable research has been made in the Dehra Dun Forest Research Institute. Under the policy hitherto followed, the Government of India had prohibited any utilisation of these stocks of

opium held in Indian States, or still grown in what was previously British Indian territory for medicinal purposes with the help of the modern advances in that science.

Opium, like any other drug, is harmful when taken in excess, but not so much if taken as an antidote. Like any poison, it is possible to utilise it as a counter poison or medicine. As such it remains to be seen whether, under the new regime, any change will be made of the policy hitherto followed even without adding more acreage to the cultivation of the poppy seed.

As regards Cinchona or Quinine and other Drugs, the figures given above hardly indicate the potentiality of India in that behalf. Even after Partition, there are large tracts of land under Forest in India as the following figures show :—

**Area under Forest. (In thousand acres)**

<b>Year.</b>	<b>Indian Provinces.</b>	<b>Pakistan Provinces.</b>	<b>Total.</b>
1942-43	62,812	5,341	68,153
1943-44	62,666	5,339	68,005
1944-45	62,128	5,326	67,454
1945-46	62,491	5,335	67,826

These are capable of exploitation for all kinds and varieties of articles, which may be raw material for Industry as well as Drugs and Medicines. A Forest Research Institute has already been established at Dehra Dun which has done good work in silviculture. But more intensive research is necessary for the development of forest produce available in Assam, and all along the mountain slopes in the North, the Himalayas, the Nilgiris and the Eastern and Western Ghats. This, moreover, is a group of articles in which the need to be nationally self-sufficient is urgent and inelastic. Considerable imports of foreign drugs and medicines occur annually, which can well be procured within the country itself to the intense relief of sickness or the incidence of disease in the country, and also result in a substantial saving in import. Two other Volumes in this Series, namely those on National Health and on Soil Conservation and Afforestation, have dealt fully with this subject, so that no further remarks are necessary here.

### Condiments and Spices.

The beginnings of the Age of Discovery by European Sailors of vast continents in the West and in the East, were made chiefly in the desire to find a more economical way to the spices of India. This country has been famous, all through the ages of her age old history, for production of spices and condiments in a large variety. They formed a group of regular exports that invariably found a profitable market in Europe and Egypt and in the realms of Solomon, of Darius, or of Alexander and Caesar.

With the rise of Mohamedan powers in the Near and Middle East, the road to India of the Classic Age was closed. A heavy toll was levied by the Turks and Arabs and other people controlling the shores of the Mediterranean, Red Sea and the Indian Ocean on the spices and condiments which passed through their domains to European countries. If only a direct sea route could be discovered, the Spice Markets of India and the Far East would be easily accessible. It was this which spurred the Portuguese at the close of the fifteenth century to embark on ever widening voyages of discovery. One of these brought Vasco Da Gama to the shores of Malabar, and all the succeeding traders, Dutch or French or British, who became conquerors in search of the spice trade of India, originally came for that purpose.

Today also there is considerable export of spices which occupy a sizeable block of land particularly in the South of India. The figures given in the Table below relate only to what was known as British India, necessarily leaving out the great spice growers of Mysore, Cochin and Travancore.

#### Acreage of Condiments and Spices.

Year.	Area in British India. (million acres).	Year.	Area in British India. (million acres).
1911-12	1.4	1937-38	1.4
1916-17	1.5	1938-39	1.5
1921-22	1.3	1939-40	1.6
1926-27	1.3	1940-41	1.5
1931-32	1.5	1941-42	..
1936-37	1.3	1942-43	..

Source:—From the Technological Possibilities of Agricultural Development in India by W. Burns, (1944).

Foot-note. No value or yield figures are available,

There are materials for food seasoning that however require a cultivated taste. For Indian food they are almost indispensable and as such if the export market cannot be retained, no very great harm would be done if these commodities could be absorbed in India. Opinion regarding the healthfulness of these may also differ, but the acquired taste of long generations, if not centuries, and the habits of the people founded thereon, have made them use species and condiments of all variety without any serious harm to their health. National Self-Sufficiency in this matter, therefore, in so far as food seasoning is concerned may be easily maintained even if an export surplus may have to be sacrificed. The lessons of recent restrictions on Indian trade and traders in Portuguese East Africa on the cloves trade, for instance, are pointers in the direction that India should be prepared to meet. Such experience must lead her to re-order her own economy including trade and production accordingly.



## CHAPTER VIII.

### Conclusion.

#### Rural Reorganisation

The reorganisation of the Agricultural community, which is one of the terms of reference to this Sub-Committee, has been discussed more fully in the volume on **Land Policy and Agriculture** in this Series. It is unnecessary, therefore, to go into it at any length here, beyond observing that, without a radical reconditioning and reorganisation, there is little hope of any plan for the improvement of crop yields in this country. Without such a basic reorganisation, there would be no chance of avoiding the greatest single handicap of the Indian farmer, viz. the excessive fragmentation and sub-division of his land. Other handicaps defects or deficiencies would be similarly easy to remedy if once this great evil is removed. The internal economies also would be much easier to achieve, and farming made more profitable and attractive if a co-operative organisation is effected.

Yet another volume in the series, that dealing with **Rural and Cottage Industries**, deals in detail with the problem of organising subsidiary industries to provide off-season employment for agricultural labour, and to supplement the earnings of the family. It is possible by means of organising such industries on a co-operative basis to utilise fully all the local resources of raw materials and labour in the community, and also to provide the local market with its immediate necessities. The transfer of the surplus population, which now presses unduly heavily on the soil, and intensifies the poverty of the agriculturist, i. e. of the country as a whole, can be effected on a large scale, only if these alternative, supplementary or subsidiary industries are economically organised, suitably equipped with tools or machines, furnished with the requisite raw materials and aided in transport, credit and marketing facilities which are today one of the crying needs of the rural community.

Having now reviewed almost every important crop grown in India as well as the collective aspect of the crop position, we may consider the programme before the

National Planning Authority in re-ordering these crops and re-allocating, so to say, the land on which they are to be grown with a view to attain National Self-Sufficiency.

According to the figures given earlier in these pages, the Union of India has about 175 million acres of land under cultivation in all. This can and will have to be supplemented by bringing under the plough additional land, the so-called culturable waste, which has remained uncultivated for generations for a variety of reasons, but not the lack of cultivable qualities in the land thus remaining untilled. It may need to be reclaimed. New capital may need to be invested on it in the shape of proper drainage, necessary tools and implements, buildings and livestock; proper ploughing, weeding and clearing. But when all that is done the land may be fit for cultivation which will probably yield more per unit than the old exhausted soil actually under cultivation. The exact estimate of land which may be added from this source is impossible to make; but that it may run into millions of acres cannot be doubted. Similarly, the time limit within which it may be brought under the plough is also difficult to say in advance. But within 10 years, with a definite programme it may be easily brought under the plough.

In addition also there is the possibility of adding to the actual land surface, or area available for cultivation, from the current fallows, by terracing mountain slopes for cultivation of appropriate crops, and by reclaiming waste land by large or small scale Irrigation Works. It is impossible to estimate with any degree of precision the total area that could thus be added to what is now being cultivated in the Union of India. In the earlier pages of this Volume some attempt has been made to make an estimate. Assuming that between 50 to 75 million acres is thus reclaimed and added to the area available for cultivation by all those means operating simultaneously, within the next ten years, not only the present shortage in food stuffs and raw materials can be made good from our own resources; the expanding needs of growing industrialism and a rising standard of living can be amply met. It may take us ten or fifteen years to achieve this; but it is not an impossibility as every investigator who has given thought to the matter has found.

Next to this physical addition to the total land surface under cultivation, there are ways and means for improving

its quality, the soil conditions, and preserving and safeguarding the soil against erosion or wastage as happens every year in some parts of the country. Other volumes in this Series, namely those on River Training and Irrigation, Soil Conservation and Afforestation, and Land Policy, have already indicated the ways and means whereby this improvement can be effected; and the volume and variety of the crops grown in India can be raised.

Besides thus protecting and safeguarding the soil, so as to guard against needless and avoidable loss inflicted upon the country, the area available can, and must, be improved in quality. That improvement will be reflected in the better nutritive value and larger yield of the crop. Every crop raised may take something from the land cultivated, which must be returned in one form or another, if the capacity of the land to go on giving crop after crop is to be preserved. The inherent and indestructible powers of the soil, the chemical and physical properties which enable crops being grown, must be maintained. Manure of all kinds has been spoken of in the preceding pages as the most important requirement and preservation of this inherent natural wealth of the country. It is not that the country lacks in manure; it is simply a matter of organising the collection and distribution of the available manure, both natural and artificial, with full regard to the appropriateness of the nature and quantity of the manure applied to particular crops grown thereon.

Improvement in seed varieties is of the same kind. The aid of modern science in discovering or developing proper seeds suited to given conditions of soil and climate, is most urgently needed in this behalf. The present Volume has mentioned several examples of such possibilities; and they cannot but be part of the National Plan.

Here, as in previous cases, it is impossible to make any precise estimate of the improvement in quality and quantity of crops that may be legitimately expected by the adoption of these means. Examples have been given in the preceding pages of the precise extent to which given crops can be raised in quality and quantity. Comparisons have also been given to show the position of other countries in regard to such crops. Altogether, the National Planning Authority would be safe in assuming that by this means at least half as much can be added to the aggregate volume of crops raised in India; and so more

than wipe off the deficit that we experience today. Needless to add that this would be in addition to the improvement effected in our crop position by the addition to the total area under the plough.

The social handicaps which prevent the best being made of the soil now under cultivation, e.g. the excessive subdivision of cultivated land, and the scattered character of the individual holdings; the intolerable burden of indebtedness on the cultivator, and of the fixed cash revenue settlement utterly irrespective of the ability or capacity of the person taxed to bear the burden; the appalling ignorance and unorganised nature of the business of the cultivator, which handicaps him heavily in marketing his produce as much as in purchasing seed or implements or other needs of life, would also go, if removed, to improve his standard of living and general enjoyment of life.

All these are ways which will have to be mutually co-ordinated and integrated into scientifically planned programme of all-round development. None of these are handicaps or impediments which can be called new, or those discovered for the first time. Nor are the remedies proposed new, untried, or uncertain in their results. What is needed is their careful weaving into a mutually consistent Plan, in which all items, all stages of the programme, as well as all parts of the country, will receive their due attention.

When the handicaps, deficiencies or difficulties outlined above, have been remedied or removed, the task of constructive activity will begin. Here the task will be of the Provincial and State Authorities, in conformity with the general principles of the predetermined Plan, to give effect to each of these methods and devices; assign land for appropriate crops, and bring new land under the plough and in improved cultivation. Provincial and State Authorities must have freedom in doing this part of the work, provided they conform to the basic framework of the Plan and contribute their quota towards the realisation of the main objectives. No specific figure can be laid down, and required to be adhered to for the different crops in the different units; but as far as possible the aim should be to encourage specialisation of crops as between the several grown in a unit, according to the soil and other conditions of each region. The existing units are,

however, too large to make a high degree of specialisation of crops very economical, or satisfying, from the point of view of the main objective in view. Most of the crops, moreover, are grown in almost every Province. Besides, the soil conditions and other requirements of raising crops differ from district to district within the same unit. It may, therefore, be as well, in order to get the utmost from each unit, to permit as many crops, and their varieties to be grown in each unit as possible. The allocation of land for each crop or variety must be the discretion of the Provincial Planning Authority.

In the volume in this Series dealing with the Administrative Machinery for giving effect to the Plan, a detailed picture has been attempted of a complete allround administrative mechanism to attend simultaneously to all aspects and items in the overall Plan. In this organisation, an important place is given to the local machinery, the executive being aided or assisted, wherever deemed proper, by some kind of an Advisory body. For the allocation of land within a unit to different crops, or their different varieties, and for the maintenance of the balance between Cash and Food crops, also, the discretion must vest with this local authority.

As no definite area can be assigned in advance to any given crop in any given unit, so no area or fixed portion can be set apart for Cash Crops, or those Raw Materials of Industry, and the Food Crops. Here, also, discretion must, therefore, remain, under and in conformity with the basic overall, National Plan, with the unit authority. The general policy must, indeed, be prescribed by the main Plan; and the National Planning Authority must be entrusted with controlling and supervising powers and authority sufficient to keep all units as well as all parts of the Plan in line. For the rest, actual administration of details must remain with the local authority. The objective of National Self-Sufficiency must be maintained at the national level as also that of a decent standard of living in regard to food as well as products of industry dependent upon raw materials provided by agriculture much better than today.

Finding the necessary and adequate capital resources, skilled labour and equipment for all-round development mentioned in these pages, need not deter us in framing and carrying out a programme of this kind, however ambitious

it may seem on paper. We have an abundance of labour,—technical, skilled and unskilled,—as well as capital resources, if only we know how to draw them out of their hiding places, mobilise and utilise them. An important matter is the reorganisation of land cultivation on a wholly cooperative basis, which would eliminate the parasitical class now living on unearned incomes from land and other natural resources, in virtue of the right of proprietorship. The reconditioning of the entire agrarian economy of this country has been referred to more than once in this and other volumes in the series; no further space need consequently be devoted to that aspect here.

Reorganisation and re-allocation of land free from all the handicaps which at present prevent it attaining its maximum yield of the best quality in all kinds of crops, would be the next question that would demand the attention of the National Planning Authority. As already stated, it can only lay down the general policy to guide the network of local authorities or bodies immediately concerned with the problem. No exact figures can be laid down; nor could the figures, even if laid down, be strictly adhered to year after year, as the changing circumstances of local climate or internal trade and international relations in general would have a growing effect on this subject. Suffice it, however, to say that, if the total land surface available for cultivation in the Dominion of India is somewhere about 200 million acres, including the land reclaimed from culturable waste, from fallow, or other directions and sources, three-fourths of that may have to be reserved entirely for the several kinds of food crops, and only the remaining one quarter may be available for cash crops or agricultural produce which form raw materials of industry. This is a very arbitrary, indefinite, *ad hoc* figure which need not be taken as anything more than suggestive.

No allocation can be made in advance as between the several kinds of food grains nor as between the various items of industrial raw materials. These will depend on the progress as well as the initial objective of the Plan in each specific case. It must be left to the National Planning Authority, if and when one is established, to work out some general principles as guide to determine these cases. It may also indicate, in the first instance, a general picture of the framework of the Plan, as also of its working in the

several units, as well as of the various crops and the industries based on some of them. Whether, however, any definite proportion of land to be devoted to cash crops or food crops is laid down; whether or not any specific areas are assigned to the growing of given crops, the National Planning Authority would be the only qualified body to deal with these questions; and prepare some tentative programme and make adjustments from time to time. There is no other way of satisfactory Crop Planning.

K. T. SHAH.

Bombay,

7th August, 1948.

## APPENDIX

### Reimposition of Food Controls.

Towards the end of September 1948, the Government of India decided to reimpose control gradually over the prices, procurement and distribution of all foodgrains in order to achieve under central direction and co-ordination by October 1949, the monopoly procurement and rationing which existed in November 1947. Further steps may be required to achieve uniformity of standards during 1950 in rationing and procurement but they would be considered in July 1949. If any particular area desires to be exempted from the standards prescribed, the Central Government would determine to what extent the exemption may be granted.

This decision was part of a programme of action to deal with the present economic situation and the threat of Inflation. The control of cotton and cloth was the first step, of food the second, while that of a few more essentials of life will follow.

The reimposition of controls over foodgrains was recommended by most of those whom the Government consulted on the measures to fight Inflation. These steps to be completed by October 1949 were approved by the Provincial and State Premiers and Food Ministers.

### Controlled Grains.

The grains to be controlled are rice, wheat, jowar, bajra, maize, barley, gram and ragi where it is important. Broadly the plan of control envisages the following :—

(a) The surplus areas, the deficit areas and the self-sufficient areas will remain cordoned off. No movement of these grains will be permitted from one Province or State to another except on Government to Government basis. Government will also have full power of control over the movement of these grains within a Province or State.

(b) In the surplus areas the surpluses will be procured from the cultivators through an agency appointed by Government at prices approved by the Central Government. All these grain surpluses together with grains from



overseas imported by the Central Government will be distributed by the latter in accordance with its basic plan of distribution to different deficit areas.

(c) To secure information of wholesale stocks and their movements, all those engaged in the purchase, sale or storage of foodgrains will be required to obtain a license and to submit periodical reports of their grain purchases, sales and stocks and

(d) to minimise hoarding by the consumers, to restore confidence and to ensure an equitable distribution of available supplies, rationing will be enforced.

### **Procurement and Prices.**

The basic aim of this control is not so much to provide food for all, as to prevent high prices and to utilise internal production to the maximum advantage. There must, therefore, be maximum procurement of internal production in each administrative area, Province or State. The details of the method of procurement have, for the time being, been left to the Provinces. But all Governments will declare a price at which they will have the power to requisition grain stocks or procure compulsorily. The prices which will be fixed should apply for the whole crop year. Government intend to reduce the procurement prices gradually to a reasonable level, fair to both the consumer and the producer.

To implement the decision taken regarding control of foodgrains, Provincial Governments have to make arrangements to supply other commodities like cloth, kerosene, iron and steel and cement to producers of foodgrains.

The prices at which grain will be issued to the rationed population will be related to procurement prices.

In order to encourage procurement, the Centre will give to Provincial and States Governments a bonus of 8 annas per maund procured. In addition, an equal bonus will be payable on quantities exported by a Provincial or State Government. These bonuses will have to be spent on measures for increased food production.

To relieve the pressure of demands on internal prices, it will be necessary to ensure maximum rationing in all

the units. As stated earlier, Government's objective will be to reach, by October next year, the position which existed in December 1947.

### **Imports and Internal Supplies**

To facilitate the transition from decontrol to control, the Central Government will make every possible effort to import sufficient quantities of foodgrains during 1949.

Subsidy will be given to the Provinces and States on imported grain based on the expenses incurred on imported grain and the issue rate of a unit.

### **Food Offences**

To prevent a sabotage of their food plan by the anti-social activities of hoarders and speculators, Government will adopt stricter measures against food offences liable on conviction to a sentence of imprisonment.

Bombay,

10th October, 1948.









